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ABSTRACT

The 26 articles in this journal issue discuss the use of the computer in the English classroom. Among the topics and applications discussed are (1) computer assisted invention, (2) word processing, (3) overcoming computer anxiety, (4) using computers in technical writing classes, (5) grading student essays by computer, (6) the experiences of an English department in incorporating computers in its programs, (7) computer assistance in the semiotics of reading, (8) computer literacy, (9) English and language education courseware inventory, (10) using the computer in an elementary school language arts classroom, (11) creating instructional software, (12) resources on computer use in English instruction, (13) teacher attitudes toward the computer, (14) using the computer to individualize writing instruction for a physically disabled student, (15) basic computer terms and concepts, and (16) the use of the computer in administrative record keeping. (HOD)

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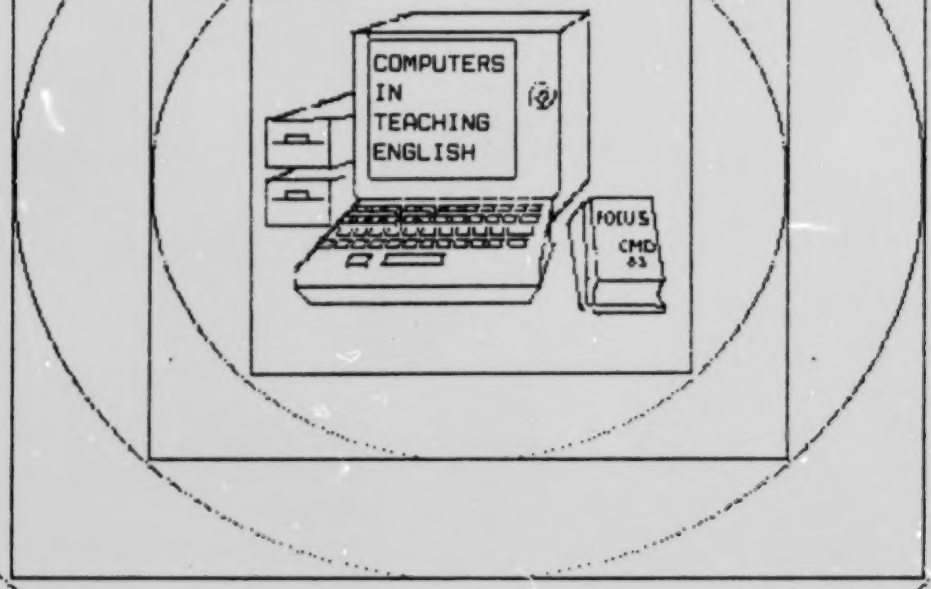

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COMPUTERS IN TEACHING ENGLISH

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WHAT LIGHT THROUGH YONDER WINDOW BREAKS?

by
Maurice A. Champagne

Idealist: Computers will profoundly change how and what we teach.

Skeptic: Computers are just another educational fad, a passing fancy of the technocrats.

Realist: Computers are another tool, much like paper and pencil.

After surviving the trials of implementing mastery learning, individualized instruction, team teaching, and film literacy into the classroom, I find it very tempting to agree with the skeptic. However, I really believe that computers will change how and what we teach. Perhaps the effects of those changes will blossom long after my teaching career has ended, but certainly the buds are green today. I agree with the realist's assertion that computers are another tool, and with the idealist's view that computers are so powerful that they will eventually transform education. However, computers are not a panacea which will solve all learning problems; perhaps they are nothing more than new tools, tools which will eliminate some old problems and create new ones.

As educators we are in the same classroom as the 19th Century teachers who found that having students write their work with a pencil on paper had certain advantages over having them write on slate lap board with chalk. That shift from slate to paper influenced the quantity and quality of work that the students did as well as the teachers' view of that work. Today's and tomorrow's use of the computer in education will be as pervasively powerful as the use of paper is in the 20th Century. As teachers we can let this technology take us where it will, or we can direct where it takes us. The fact that you are reading this article implies that you want to determine how you will use computers in your teaching. Welcome idealist, skeptic, and realist! Welcome one and all!

The light from the window referred to in the title is not Juliet's, but the computer's cursor, blinking at you, waiting for you to respond. Before you do so, let me give you a cursory run through the areas in which computers are affecting education. I will also suggest what seem to be the most immediate effects computers will have for the teaching of English.

Currently, educators are using computers in schools in five ways:

In administrative record keeping,

in teaching computer literacy,
in teaching programming,
in teaching word processing, and
in using computer assisted instruction (CAI).

We are undoubtedly all too familiar with the administrative uses of the computer. One of the most common examples of this use is in attendance procedures. Certainly, attendance record keeping in my school is greatly improved now that we have a daily computer printout of the previous day's absences. Gone are the days when a student has to sit outside the office of the Dean of Students during my English class, waiting to get an admit for having missed a math class. Now our Dean has time to devote to our true truancy and deliquency problems. Though I dread those days when we have no attendance printout of the names of my students who were excused and those who were not for the previous day. Administrative uses of computers are peripheral to the use of computers in my classroom teaching; however, through administrative use of the computer for the record keeping of attendance, more students are present in my classroom on a daily basis.

"Computer literacy" is one of the new educational buzzwords, one more skill some feel students must learn, yet we lack a commonly agreed upon referent for that phrase. Perhaps both beauty and computer literacy are in the eye of the beholder. Let me suggest a generality of meaning for "computer literacy" for those who are hearing only the buzz.

Since computers are on the verge of becoming as common as the TV and the telephone, students need to be as comfortable with computers as they are with their stereo systems. They should be able to use computer programs set up for a "non-computer" person. As English teachers we should notice that using the computer assumes the ability to read and the ability to follow directions. Computers and humans interact through language, not really through numbers, even though numbers are the native language of the computer. A functional non-reader will be a non-functional computer user. All high level computer languages emulate human language. In the near future only a small group of research computer scientists will use the computer language of numbers; however, every person will have to become more sensitive to the denotations and connotations of human language in order to use computers at all. The computer increases the need for students to be able to read and respond to what they read if they are to be able to follow the instructions on the use of the computer. If computers are merely tools, then computer literacy means learning to use this brave new tool.

The purposes of teaching students to create computer programs are multifaceted. For some students a class in programming is a career exploration; for others it is an extension of computer literacy. Few of the 600+ students who take computer classes in my school are likely to become computer programmers. All are likely to use computers at home and at work. For all students learning to program is another form of learning how to think just as the study of mathematics or the study of literature are ways in which students learn how to think as they study mathematics or literature. The study of computer science is becoming a part of every person's general education, part of a liberal arts education.

Initially the teaching of programming seems unlikely to have a direct impact on the English teacher. However, the computer, even more than the most demanding of English teachers, is unforgiving of errors. Students who are learning to program become as interested in the distinction between the uses of the comma and the semicolon as any writing teacher. Though these uses are very different in a computer program from their uses in an essay, students are sensitized to their importance as a function of a form of communication. At the very least, the teaching of programming is in part an extension of the computer literacy use of the computer and perhaps an extension of the liberal arts education as well.

"Word processing" is not a personally defined phrase as is "computer literacy," but rather a newly created phrase to supplant the word "typing", just as the word processor will replace the typewriter. A word processor turns a computer into a very powerful typewriter. I love using my word processor because it makes production of my writing easier for me than a typewriter does. My handwriting is difficult to read (my students say "impossible") and my typing is fast and full of errors. However, my typing with a word processor is letter perfect because no error is permanent. When I proofread to find my ubiquitous typing errors and my occasional spelling and punctuation errors, I simply edit the writing by using the change command or the insert command of the word processor. No longer am I able to blame my typing for my errors. In the revisions of this article, I found that I needed additional transitions here and clarifying sentences there. However, I did not need to retype the entire page in order to revise. The commands of the word processor permit me to insert, delete and reorder words, phrases, sentences and paragraphs. Perhaps through the use of a word processor my students will not find revising their writing quite so onerous. Be careful here. It is quite easy to make cosmetic changes in writing with a word processor; however, rewriting often requires the rethinking and restructuring of ideas. Could an infinite number of students using an infinite number of word processors write one of Shakespeare's plays? The word processor is the tool. Composition still demands composing as a mental activity. However, the word processor may make the re-composing process easier for students whose handwriting and typing hinder their composing efforts.

Now we arrive at the fifth way in which computers are used in education, through CAI (computer assisted instruction). Can a young acronym from the jargon world of computers find success in the day to day life of the English classroom? Maybe. It depends upon us as English teachers, upon what we want the computer to do for us in our teaching.

Rather than suggest ways in which I think computers should and should not be used in the English classroom, I will describe some CAI programs which already exist for the English teacher to use. Answer for yourself the nonrhetorical question of how computers should be used to help you teach. Please note these two perceptions: I have observed students respond very positively to these or similar programs, but I have yet to see a CAI program which "turned on" every student who used it. CAI is an inviting means for the English teacher to help students improve their reading and writing abilities; however, CAI is not a panacea for student disinterest in school work. The teacher will remain the primary motivator of student interest and effort. As English tea-

chers we will still need to sell our students on the value of reading and writing, on the value of what we want them to learn.

The CAI programs for English/Language Arts first developed were drill and practice programs for grammar and usage. For example, on the MECC disk, Volume I for Language Arts, students are shown a sentence and asked to identify the part of speech of the word pointed to by the arrow. I have developed a couple of programs of my own, one to teach students how to punctuate titles in a sentence and one to drill the usage of commonly misused homonyms ("to-two-too", "your-you're", etc.). Do you want the computer to teach grammar and usage? Milliken has a program which teaches sentence combining. If these programs do what they claim, should they be used in the teaching of English?

Writer's Workbench is part of an automated office system created by Bell Laboratories for in-house use. Currently, Colorado State University is piloting a version of this very powerful word processor in its rhetoric program. Workbench analyzes the student writing, pointing out spelling, usage, agreement errors, counting specific word frequencies, listing sentences with structural errors, and reporting all those other common problems in student writing. Would you like to have the computer analyze your students' writing? The Bell Lab version (though not the one used by Colorado State) has the option of making corrections of these errors and will even rewrite wordy sentences for clarity. Would you like that option for you and your students?

Computer Assisted Instruction can also be used to help students with their writing. A colleague of mine, Veronica Murphy, has written a computer program to help her students write six simple types of poetry (e.g. word cinquain). The students choose which kind of poem they want to write. The program presents an explanation and an example of the poem, and prompts the students line by line as they write their own. She also has developed a program to guide students in writing a simple adventure story. Yes, it is computer as creative writing teacher. Interested? Would you use it? Should you?

Educational game programs can be used to allow students to explore the structure of the English language. Jabbertalky, a word game disk by Automated Simulations, Inc., allows the student to play with the semantics and syntax of language. One of its programs creates phrasings in the style of newspaper headlines, using sensible but randomized words in correct grammatical structure. The student or teacher can create another style of talk in the program. Radio Shack's Cryptogram asks students to decipher a coded sentence. I wrote a word guess game in which the student must guess the computers hidden four letter word, using a four letter guess word. The computer reports how many letters are in both the student's word and the computer's word, but not which letters are the same. In these programs students must use their reasoning ability and their knowledge of language as they manipulate language through these games. Do you want students to use the computer to play with language, manipulating words, phrases and sentences?

The computer will affect how and what we teach, even if we choose not to use Computer Assisted Instruction (CAI). I can only fantasize the reactions readers may have had to the ways in which the computer is affecting English

education. However, I am certain that the range of reaction is varied. Perhaps one influence that computers will have in education will be as a catalyst which makes us refocus the questions of what we should teach and how we should teach it. I hope that your answers to these questions determine your response to the computer as a tool for you to use in your teaching rather than your attitude to computers in general.

Pessimist: Computers will profoundly change how and what we teach.

Optimist: Computers will progoundly change how and what we teach.

May the cursor be with you!

Wheeling High School
H.S. District #214
Wheeling, Illinois

BOOKWORMS AMONG THE APPLES

by
CAROL KUYKENDALL

In mid-April, I made a speech titled "Bookworms Among the Apples." Several hundred miles from home in a banquet room filled with English teachers, I could say my full piece about literature and computers. The call was not for less technology; it was for more reading--reading beyond the frame of a cathode ray tube.

Ten days later, back in Houston, my superintendent made the same speech. The words were different but the message the same: don't buy that Goodbye, Gutenberg stuff. Don't believe those gee-whiz futurists who insist that books will soon go the way of Edsels, hula hoops, and dinosaurs. Don't give up on literature or the other humanities. In the high-tech future, high-touch experience with books will become more important, not less.

The superindendent saying my piece--and then some--was not just any superintendent. He was Billy Reagan, nationally known for pushing schools into the Information Age. The push in Houston is dramatic. A Department of Technology, with its staff of thirty-two, runs nonstop training sessions for administrators and teachers. Despite economic hard times and an overall 5% budget cut, funds for microcomputers and software have just been increased by a million dollars. Add those new computers to the 600+ already in the schools and the 500+ being donated by local civic groups, and that's lots of Apples for lots of teachers. Actually, those computers are for students--and even their parents, who can check out micros and work with their children at home. Yet Dr. Reagan insists that we haven't seen anything yet.

That's the superintendent who calls for renewed commitment to literature. "Lose books," he says, "and we've lost it all." This superintendent who still thinks like a reading teacher knows that it's possible to drown in information and starve for meaning. He also knows that technology and humanity aren't antonyms, indeed that technology itself can help swell the population of bookworms.

One way computers can help is by freeing teachers and students from the tedium of repetitious, lock-step basic skills instruction. Seymour Papert, author of Mindstorms, Children, and Computers, believes that technology can shift the emphasis from teaching to learning and allow that learning to take place in informal environments. Day-to-day interaction with computers in a natural setting could allow children to learn skills as easily and successfully as they learn to talk. Up to a point, the model of learning would be the same.

It's at this point that high tech must yield to high touch. Consider the story told in a recent issue of Theory into Practice about a first-grader whose teacher had just read a new book aloud to the class. When asked to write her opinion of the book, a six-year-old laboriously printed, "The book was okay. I love you." For this little girl, the book can't be separated from the voice that read it aloud. Good feelings about the teacher and the story flow together.

Margaret Meeks must have been thinking of such feelings when she wrote, "Good readers pick their way to literacy in the company of friends who encourage and sustain them, and the enthusiasm of a trusted adult can make all the difference." In other words, young people learn from human models, both teachers and peers.

By handing the so-called basic skills over to computers, we can free ourselves to be better models. We can read aloud more often. We can spark more conversations about books. We can spend more time in the library with kids.

There, the computer becomes more than a tutor. With a little help from word-processing software, it can become a clearinghouse for personal communication about books. Students can enter titles and register opinions of what they've been reading. They can also make recommendations and ask questions, then find out what their classmates like and why. This option won't be lost on any teacher who knows the contagion of good books and the satisfaction of rehashing shared reading with friends. Using the computer as an electronic bulletin board can help start a run on library shelves and an epidemic of book talk.

It's just a matter of time--and not much of it--until school media centers offer interactive video. Imagine televised scenes from first-rate stories and plays interspersed with interpretive questions to which students respond. Think how much money publishers make on paperbacks popularized by movies and TV. It's not hard to see the possibilities of interactive video for transforming ho-hum readers into bookworms.

In the media center or in the classroom, young readers need to connect personally with what they read. Teachers in the primary grades seem to have the right idea. They realize that children come to them thirsty to blot up stories and to enter into poems with gusto--often with their bodies as well as their emotions.

James Britton's experience with a group of eight-year-olds isn't really unusual. One day this noted teacher was reading poems aloud to a class. Most happened to be about winter, like the James Stephens poem that begins:

> The wind stood up, and gave a shout
> He whistled on his fingers, and
> Kicked the withered leaves about.

At the end of the poem, a small boy--in Britton's words, "hugging himself like a cab driver on a cold day"--implored, "Please sir, will you read us a warm one?"

Unfortunately, most children don't seem to be chilled or warmed by poems after age eleven or so. Some of the responsibility, I'm afraid, lies with us, with our compulsion to treat poems and stories as fodder for skill and drill rather than as personal transactions. The questions we ask come with an answer key, and children learn very quickly to tell us what we want to hear rather than what they really think or feel. As students move up through the grades, unabashed response to literature is typically discarded with Big Chief tablets and fat crayolas. Too often, stories and poems themselves almost disappear beneath the crusty barnacles of historical background, critical theory, and technical terminology.

The solution to this problem isn't technological. It's human. But technology

can help us sort out our priorities. It can even help young people sort out their responses to stories and poems. A case in point is the new computer-assisted program aptly titled Return to Reading. Each diskette, designed to follow the reading of a particular novel, begins with a set of items exploring personal response: What do the events in the story mean to me? Who is the special person in my own life? What personal feelings does this book evoke? The computer accepts and reinforces any response: there is no answer key. After a more conventional series of comprehension and critical analysis questions plus vocabulary practice, the program returns to personal response. The final section probes the student's own connections with the novel and recommends thematically related reading. Throughout the program, students are invited to keep a response journal.

This exemplary computer courseware does nothing a good teacher can't do in a half-hour one-to-one book chat. But it's hard to chat with thirty-five students in fifty-five minutes, especially about five or ten different books. Even the best computer courseware leaves plenty for teachers and students to do together. In this program, they can start where the computer leaves off, perhaps by sharing and extending ideas captured in the response journal.

The response journal in this computer-assisted literature program is no idle extra. It's a means of insuring that reading and writing feed each other. Students need both to make meaning. They need to see that both involve composing--putting parts together to make a whole. Composing parts into meaningful wholes has always been important, but the process is becoming truly critical. As Alvin Toeffler has noted, the new technology delivers messages in "truncated blips and blobs." The information problem increasingly becomes not one of supply, but of selection and synthesis--in short, of meaning.

Reading and writing stories and poems help young people make meaning. It was a psychologist, not an English teacher, who observed that we live more by fiction than by fact. But it was an English teacher who said--most aptly--that poetry "deals not with things as they are but with things as they matter." Reading and writing help all of us sort out what matters.

This point brings us back to the job of swelling that bookworm population. One way to get students reading is to get them writing. Help them discover how poems, stories, plays, and essays look from the inside. Writing sharpens the appetite for reading, which sharpens the appetite for writing, and so it goes.

Again, computers can help. Local evidence includes both the amount and quality of writing by kindergartners and first-graders piloting a computer-assisted reading program based on language experience. In this program, pairs of children wearing earphones work together at a microcomputer, which uses color graphics to teach sound/symbol relationships. From the beginning, children touch the key that writes that sound. Soon, they are using the keyboard to write their own pieces. Three months into the program, six-year-old Ashley wrote this one:

my turtle

I have aturtle named luey he sets in a chair at my house.
he plays in the sand with me.
we lie under my tree.
my turtle named luey goes were ever I go.
I also have apet turke.
I play with him to.
we like eachother.
hes ten years old and very tall.
we set on the logs togather.

Admittedly, it would be stretching the point to call Ashley's piece literature. But "my turtle" shows an ease with written language that most first-graders don't reach by February--especially first-graders in an urban low-SES school. The piece also reflects a sense of personal authorship. Ashley and her classmates publish lots of "books." They also read lots of books by other authors.

This pilot provides only one example of how technology can support writing, which in turn supports reading. We're just beginning to learn how word processing can free writers to concentrate on what really counts, capturing and shaping ideas. We're only beginning to exploit the power of word processing as a prewriting as well as a drafting and revising tool. True, it will be a while before most schools can afford this technology--but not too long. Already, some word processors cost less than some food processors. (Of course, like food processors, they can turn out gourmet fare or mush. But so can pencils and ballpoints.)

Fledgling writers need all the help they can get. So do writing teachers. We have a long way to go, but the teaching of writing is taking on a new vitality. Part of that vitality is technological; most is human. But the two need not work at odds. They can be as mutually supportive as reading and writing.

With only a few pages of the calendar between us and 1984, English teachers seem to be making friends with what columnist Sandy Grady dubs that "sleek, swift, arrogantly efficient doohickey," the computer. Maybe it's natural for us to feel at home in the Information Age because we've always been in the information business. Maybe more and more of us are struggling toward personal computer literacy because it <u>is</u> literacy. And maybe--just maybe--we can use the new technology to support what Maxine Greene called for at the 1983 ASCD Conference: "to teach students what it signifies to come to know, to conceptualize, to derive meaning, to build and project one's own images, to see and hear resemblances, and to distinguish between thinking and knowing."

Isn't that literature?

And won't literature stock go up as technology itself nudges us into a new awareness of our own humanity? Consider this comment from a professor at MIT:

> Anyone who has tried anything as mundane as getting a robot to wave its arm around, a TV camera to see, or a computer to understand natural language will be filled with awe at the effortless behavior of an average three-year-old child. In working with these automatons, researchers are really discovering everything about the human being.

Well, not everything. Robotics may indeed be an exercise in self-knowledge, but it stops where literature begins.

This trend to look inward gives us a timely chance to act on our belief in literature. As <u>Megatrends</u> author John Naisbitt says, trends, like horses, are easier to ride in the direction they're already headed. Certainly we should hop aboard this one while it's going our way.

Houston Independent School District
Houston, Texas

THE WRITE IDEA:
COMPUTER ASSISTED INVENTION

by
STEPHEN TCHUDI

Like a good many English teachers who have been intrigued by the computer movement, I have been disappointed by the content and quality of many language arts computer programs on the market. Whether one looks at elaborate packages put out by the major publishers and computer manufacturers or at the "basement programs" produced by computer hobbyists, language programs seem inordinately concerned with drill, especially in spelling and grammar. Now a computer can do that sort of drill very effectively, more effectively than an English teacher, but such programs seem to me pedagogically obsolete, putting the proverbial "old wine in new bottles." The new bottle of the computer will have to offer more creative kinds of language programs if it is to be more than an educational fad for English teachers.

I'm a basement computer hobbyist myself, working with a Radio Shack Color Computer (16K, Extended Color Basic) that I purchased about a year ago. As I have tested various commercial programs and learned some of the ins and outs--the bugs and debugs--of computer programming, I have become interested in the potential of the personal computer as an aid in prewriting: the invention stage of composition. Some of the things a computer does extremely well—such as asking questions, waiting patiently for a reply, and remembering what people tell it--make it useful in getting students to think before they write, helping them gather ideas and think about them before trying to get them down on paper.

"The Write Idea" is a program I have developed to help students from the middle grades up develop writing ideas. The computer (or, more accurately, the program author) raises a series of questions, asking the student to think about and list past experiences: "firsts," "people," and "events." These are preliminary writing topics, and the student is guided to choose one of these experiences to write about. Next the program encourages the student to list relevant details--sights, sounds, actions, people--and asks him or her to describe an audience for the paper. Finally, the program has the student talk through a possible beginning, middle, and ending for the paper. In a twenty minute run through the program, a student will characteristically create a two or three foot long printout listing ideas and details.

Unlike drill programs, "The Write Idea" has no "right" answers. It uses the computer as an electronic blackboard, encouraging brainstorming and drawing on the appeal of computers to most students and the technology of a high speed printer to make the listing of details simple.

A program like "The Write Idea" can be adapted to almost any kind of writing, including creative and expository forms, simply by inserting different questions (or using different "heuristics," to draw on the jargon of our trade). Although such programs can be used in an English language arts class equipped with a computer, I suspect they will prove more practical in individualized settings like language labs, where an instructor might have several computers and several students working on different programs simultaneously.

The printout that follows shows the program in operation. The statements in small capitals actually appear on the glowing screen of the television monitor rather than on paper. The boldface statements preceded by asterisks are student answers, in this case those of a fourteen-year-old high school freshman. Boldface statements preceded by a dash are generated by the computer to format and organize the student's ideas.

Note: This printout shows how the program works, but is not the program itself. If readers of FOCUS would like to examine the program, I will supply either a ready-to-run cassette (for the Radio Shack Color Computer) or a printout that could be used by other programmers to adapt "The Write Idea" for other computers using BASIC language. Please enclose $5 to defray costs. Mail to the address that follows.

```
T H E   W R I T E   I D E A

"FINDING SOMETHING TO WRITE ABOUT
   FROM PERSONAL EXPERIENCE"

   COPYRIGHT (C) 1983
     STEPHEN TCHUDI
     **THE INKBYTE**
    2011 PAWNEE TRAIL
OKEMOS, MICHIGAN  48864

LOTS OF PEOPLE HAVE DIFFICULTY FINDING SOMETHING TO WRITE
ABOUT.

THIS PROGRAM WILL HELP YOU FIND IDEAS IN YOUR OWN EXPERIENCE.

ALL YOU HAVE TO DO IS PEEK AND POKE IN YOUR MEMORY TO RECALL
INTERESTING EVENTS AND PEOPLE.

THE COMPUTER WILL ASK YOU A FEW QUESTIONS.

PRESS <ENTER> WHEN READY.

<ENTER>
```

```
WHAT IS YOUR NAME?

 PATRICK

OK, PATRICK, TURN ON YOUR PRINTER.  PRESS <ENTER> WHEN THE
PRINTER IS ON.

<ENTER>

WE'LL BEGIN WITH A CATEGORY CALLED:

                    * * * F I R S T S * *

 THINK OF SOME FIRSTS IN YOUR LIFE:
   FIRST LOVE . . . OR FIRST KISS.
      FIRST PET . . . OR FIRST DEATH.
         FIRST DAY AT SCHOOL.
            FIRST REMEMBERED BIRTHDAY.

"OK, GOT THE IDEA?  PRESS <ENTER> WHEN READY.

NOW LIST SOME OF THE FIRSTS IN YOUR LIFE.  PRESS <ENTER> AFTER
EACH ONE.  PRESS <XXX> WHEN YOU'RE OUT OF IDEAS.

--SOME 'FIRSTS IN THE LIFE
   OF PATRICK:
        ***A SIAMES CAT
        ***MERCURY SPLASHDOWN
        ***DEATH OF GRANDMOTHER

<XXX>

GOOD, PATRICK.  LET'S KEEP GOING.

THE NEXT CATEGORY IS:

                    * * P E O P L E * *



WHO ARE SOME OF THE IMPORTANT PEOPLE IN YOUR LIFE?
   FRIENDS . . . PARENTS . . . GRANDPARENTS
      PEOPLE AT SCHOOL OR WORK . . . PEOPLE YOU ADMIRE
         FUNNY PEOPLE . . . SAD PEOPLE
            FAMOUS PEOPLE . . . HERO<INE>S

LIST SOME OF THE PEOPLE IN YOUR LIFE.  PRESS <ENTER> AFTER EACH
ONE. TYPE IN <XXX> WHEN YOU'VE FINISHED.
```

--PEOPLE IN THE LIFE OF PATRICK
***HARRY DETENS
***CHARLES WILLIS
***MOTHER

<XXX>

LET'S DO ONE MORE CATEGORY:

EVENTS

OR

HAPPENINGS

BY NOW YOU KNOW THE GAME, SO BEGIN LISTING IMPORTANT EVENTS IN YOUR EXPERIENCE. PRESS <ENTER> AFTER EACH ONE. <XXX> TO MOVE ON.

--EVENTS IN THE LIFE OF PATRICK:
***GOING TO LONDON
***FLIGHT OF THE COLUMBIA
***ATTEMPT ON REGAN'S LIFE
***FIRST DAY AT HIGH SCHOOL

<XXX>

THAT'S THE END OF THE IDEA GATHERING. NOW LET'S PICK A TOPIC TO WRITE ABOUT.

TAKE A LOOK AT YOUR PRINTOUT. WHICH OF THE IDEAS ARE THE MOST INTERESTING TO YOU?

PRESS <ENTER> TO CONTINUE.

<ENTER>

NOW, WHICH ONE IS THE MOST IMPORTANT TO YOU?

IT WILL MAKE A GREAT WRITING IDEA. TYPE IN THE TOPIC HERE.

--THE TOPIC SELECTED BY PATRICK IS:
***GOING TO LONDON

OK, PATRICK, PLEASE TELL ME A LITTLE ABOUT THAT TOPIC. TYPE IN A FEW WORDS OR SENTENCES ABOUT IT.

--THE IDEA OF THE PAPER IS:
***STAYED IN CRICKLEWOOD
***WERE THERE ALL SUMMER

ONE OF THE MOST IMPORTANT THINGS ABOUT WRITING IS TO BE SPECIFIC, TO USE LOTS OF EXACT DETAILS.

LIST SOME DETAILS ABOUT YOUR TOPIC.FOR EXAMPLE, LIST SOME "SIGHTS" ABOUT IT. WHAT SHOULD YOUR READER SEE?

--SIGHTS:
***CONSTANT RAIN
***DRIVING ON LEFT
***HOUSES OF PARLIAMENT WERE DIFFERENT THAN OURS

LIST SOME SOUNDS OR NOISES.

--SOUNDS
***POLICE CARS
***CROSSWALK WARNING SIGNALS
***WOOSH OF THE SUBWAY

THINK OF OTHER DETAILS USING THE SENSES:
SMELLS? TASTES? FEELINGS?

--OTHER SENSES:
***SUDDEN DOWNPOUR OF RAIN
***BURNING HANDS ON COFFEE CUP

THINK ABOUT ACTIONS (OR "VERBS" IF YOU TALK 'GRAMMAR'). LIST SOME ACTIONS FOR YOUR WRITING IDEA.

--ACTIONS:
***THE SPEED OF THE SUBWAY
***SLOW DRAGGING OF THE BUSSES

AND NOW LIST PEOPLE. WHO ARE THE MAIN 'CHARACTERS' IN THIS 'DRAMA'?

--PEOPLE
***PEOPLE AT SPEAKERS' CORNER
***OWNERS OF A FISH AND CHIPS
***THE DRUNKS

EVERY COMPOSITION HAS AN AUDIENCE--THE PEOPLE WHO READ IT. THINK OF THE AUDIENCE FOR THIS PAPER. WHO WILL YOUR READERS BE?

FRIENDS?
FAMILY?
CLASSMATES?
TEACHER?

DESCRIBE YOUR AUDIENCE.

--THE AUDIENCE FOR THIS PAPER IS:
***FRIENDS AND RELATIVES

IN A FEW WORDS, TELL WHAT YOU'D LIKE THEM TO LEARN OR UNDERSTAND FROM YOUR WRITING.

--THE AUDIENCE SHOULD LEARN:
***WHAT AN INTERESTING CITY LONDON IS.

IMAGINE YOU ARE TALKING TO SOMEONE IN THE AUDIENCE. YOU ARE GOING TO TELL THAT PERSON YOUR STORY. HOW WOULD YOU BEGIN?

A GOOD BEGINNING MIGHT BE:
***SOME PEOPLE SPENT LAST SUMMER DOING VERY LITTLE. HERE'S WHAT I DID.

WHAT NEXT? WHAT WOULD YOU TELL THEM AFTER THAT?

--NEXT WOULD COME:
***ABOUT MY ADVENTURES

AND WHERE WOULD YOU END? WRITE DOWN HOW YOUR STORY ENDS.

--AND IT MIGHT END:
***ON THE PLANE FLIGHT BACK TO THE STATES.

OK, PATRICK, YOU'VE TOLD ME A LOT ABOUT YOUR SUBJECT. YOU HAVE:
LISTED SPECIFIC DETAILS: SIGHTS, SOUNDS, ACTIONS, PEOPLE
YOU'VE DESCRIBED YOUR READERS.
AND YOU'VE TOLD ME ABOUT YOUR BEGINNING, MIDDLE AND ENDING.

**********IT'S TIME TO WRITE**********

USE YOUR PRINTOUT AS A GUIDE.

YOU'VE PLANNED YOUR WHOLE PAPER.

IF YOU ARE USING A WORD PROCESSOR, PLUG IN THE CARTRIDGE AND BEGIN DRAFTING.

OTHERWISE, USE THAT GOOD OLD WORD PROCESSOR:
PAPER AND PENCIL.

REMEMBER, NO COMPUTER CAN WRITE A PAPER FOR YOU. IT'S YOUR TURN NOW. I HOPE I HELPED YOU GET STARTED.

**********G O O D L U C K **********

Department of English
Michigan State University
East Lansing, Michigan

COMPUTERS: CHANGING WRITERS' RELATIONSHIPS WITH THEIR COMPOSING PROCESS

by
Warren Self

Looking forward from the beginning of the era of computers in the English language arts classroom, those of us who may already be nervous about our need to become computer literate can become even more anxious as we look at catalogs of courseware and computer hardware. A new world of teaching technology is evolving rapidly, and that can make many of us feel as if we are becoming anachronistic in our own time. To alleviate that feeling, we should acquaint ourselves with this new technology and develop some insights into how it can be used to enrich teaching and learning. Since we write and teach others to write, one appropriate introduction to the computer is to see it as a new writing tool. Rather than thinking of the computer as a mysterious machine that solves problems, that manipulates complex mathematical formulae, that keeps track of financial transactions, and that can perform any number of other complicated operations faster and more reliably than humans, it may be profitable for us to think initially of a computer as an improved version of the typewriter.

Like the typewriter, the computer can do none of the writing for us or our students, but it can enable us and our students to write with less labor and with more thoroughness. The computer can also help writers overcome the inertia of human laziness and reluctance and permit them to take full advantage of their knowledge of the composing process.

Almost two years ago, I began to consider changing from writing with pen and typewriter to writing with a computer. In journals and magazines, I began reading other writers' accounts of their writing experiences after they had switched to writing on a computer. Many of them reported that they revised more and produced what they thought were better texts after they began writing on computers. I talked with a reporter from a metropolitan newspaper who had been extremely reluctant to make the transition from the typewriter to the newly installed computer terminals on which reporters were to compose their stories. He had been so reluctant and so resistant, that his editor removed his typewriter and forced him to learn to use the computer. Within a few weeks, he reported, he had become both fascinated with and addicted to writing on the computer. He claimed his stories were better written and that he was spending more time revising each story or article. Moreover, he was finding it possible to write more stories in the same amount of time.

Faced with having to complete a major writing task for the university self-study report, I began seriously to consider learning how to use the computer as a writing tool. I was skeptical, in spite of all the good reports

I had heard and read about this way of writing. With no knowledge of computers and with an instruction manual furnished by the university computing center, I taught myself in a few short sessions at a terminal how to write, revise, edit, and print a text, using the computer. I began writing on a computer with the word processsing program available on the university mainframe computer. That program is not nearly as easy to use as many of the word processing programs now available for microcomputers. But it was a sufficient introduction to the possibilities of writing on a computer to convince me that I could write better merely by changing the tools with which I wrote.

For nearly two years now, I have done almost all of my writing on computers. During the last year I have used my own microcomputer, an Apple II Plus, and a word processing program, Screen Writer II, to write papers, course descriptions, letters, memoranda, newsletters, grant proposals, tests, and numerous other things. It is a rare event now when I write anything that is to be given to someone else with any other tool than the computer. I am an expert user of the word processing capabilities of my computer. I am not, however, able to explain how the computer works. Nor can I program a computer to do sophisticated tasks; my daughter, Michelle, who is twelve years old and who has taken a course in programming, knows more about how a computer works and how to program a computer than I do. And I believe that fact helps me make a point. Knowledge of computers and computer programming is not necessary for one to use the computer as a writing tool.

Since I have been writing on a computer, I do not believe that my own writing process has changed significantly. I do believe, however, that my relationship with my writing process has changed dramatically, allowing me to solve two problems. First, before I switched to writing on a computer, I was writing a lot, and as a multi-draft writer, I was spending a great amount of time re-copying and re-typing successive drafts. Too often in the latter stages of revision, I decided whether to change a text not in terms of rhetorical concerns but in terms of human concerns: whether I had time to type another version and whether I had the energy to type another version. Frequently, I settled for a version of a paper that I knew was incomplete. I could see how to make the paper better; I could recognize that some sentences needed revision; I could see a better arrangement of the material; I could see the advantage of adding some additional explanations or illustrative material; I could see that some things might be profitably deleted. But time after time, I chose not to make those revisions because I did not want to re-type; I "satisficed"; I passed on to readers a text that I felt was less than it should have been. As a writer, I was unhappy about that tendency in my own practice. As a teacher of writing, I was constantly telling my students they were guilty of the same fault, that they were giving me papers they could have revised and improved. Their responses to me were remarkably like my own excuses to myself; they did not have time to revise more, or they had revised until they were tired of doing it. My students and I shared a problem, and I could only hypocritically urge them to do what I, myself, was often unwilling to do.

Second, I have known that to write well, I have to be creative and spontaneous as well as critical and cautious. I have to let my writing help

me create and express my understanding, and I have to shape and craft that expression for others. A couple of years ago, when I read Peter Elbow's description of the two conflicting skills that writing requires, I knew that he had described this second problem in my writing process. In Writing with Power (Oxford University Press, 1981), Elbow said that writing requires a person to create and to criticize. He suggested that the problem writers must solve is how to manage these two conflicting skills, and he offered this advice:

> Most of the time it helps to separate the creating and criticizing processes so they don't interfere with each other: first write freely and uncritically so that you can generate as many words as possible without worrying whether they are good; then turn around and adopt a critical frame of mind and thoroughly revise what you have written--taking what's good and discarding what isn't and shaping what's left into something strong. You'll discover the two mentalities needed for these two processes--an inventive fecundity and a tough critical-mindedness--flower most when they get a chance to operate separately. (p. 7)

I could find no fault with that advice. What I could not discover initially was a way to put that advice into practice. Before I began writing on a computer, I was very cautious and critical during the early stages of my writing process. I made every effort to write as well as I could to minimize the amount of rewriting I would have to do. Only rarely in initial drafts could I separate my creative and critical skills.

I first read Elbow's advice at about the same time that I began writing on computers. I did not know then that my new writing tool was going to provide me with the means to make the separation between creating and criticizing both more profitable and more absolute than it had ever been before. Nor did I know initially that writing on the computer would permit me to write multiple drafts of a paper without dreading the work.

When I write on a computer, I see my text initially on a CRT, a monitor that resembles a television screen. My words move up and down across the screen as I keep adding words to the text or as I scroll forward and backward through the text. My relationship with these words is different from my relationship with words I have written with a pen or a typewriter. The words on my monitor are less permanent; they have motion and a transient quality that alters my psychological relationship with them. They are less like permanent images that must be effaced to be altered, and more like fluid matter capable of many possible shapes and arrangements. Sensing the words' transience, I develop less of an attachment to them. That detachment makes it easier for me to attempt alternative arrangements. Moreover, the capabilities of the computer make it easy for me to cause the words, sentences, and paragraphs to assume different arrangements on the screen. With a few strokes on the keyboard, I can move a sentence or paragraph to a new location; I can substitute one word for another throughout an entire text; I can alter a sentence; I can delete a word, sentence, or large block of text. I can add new material at the beginning, in the middle, or at the end of a text--without having to retype what I have written previously. When I am working with

my composition on the screen, the words are written in light, not in ink. Their transiency makes it possible for me to manipulate them without feeling as if I have to labor to alter a concrete form. Moreover, I know that whenever I make any of these changes, I am merely experimenting; I am not making any permanent change, for every operation is easily reversible. What has been added can be deleted; what has been moved can be returned to its old location; what has been deleted can be restored.

This new relationship that I have with my words as they appear on the screen makes it possible for me to write more "freely and uncritically" during the early stages of my writing process because I know that what I am writing has an impermanent form that I can so easily reshape. Writing on the computer is also a much more transparent act. I worry less about how I am expressing myself and attend more to what I am expressing. I am able simply to create, knowing that whatever I write initially can be amended and revised without an excessive investment of time or energy.

Once I have completed a draft on the computer, I can get a copy of it from a printer connected to the computer. When I see my draft on paper, it is different from the draft with which I have been working on the screen. The printed copy allows me to see the text in its entirety; on the screen, I can see only a small portion at a time. The printed copy, therefore, allows me to compare different sections of my text more readily than the monitor does. Another difference is that the printed copy, like a typed copy, gives my text a concrete, fixed form. I can see it, hold it, and write on it. That difference makes my reading of it a new experience and allows me to see the text in a new way; I do not feel as if I am reading my text again; rather, I feel as if I am reading a text for the first time, for it is the first time I have seen it in that physical form. As I read it, I freely mark it up, making suggestions for revision, adding notes about ideas in the margins, editing sections of the text. I am not at all hesitant to be a severe critic. I can return to the words in light and easily and swiftly manipulate them into a new shape.

As I compose a text on a computer, I go back and forth between these two representations of my text, altering it until I am confident that I have expressed my knowledge in the best manner possible. I may go through as many as nine or ten drafts of a paper, seeing each of those drafts on the screen and on paper. Each of those printed drafts, moreover, is like a new paper, a clean copy on which I can make additional critical judgments.

I have noticed that the kinds of changes I make in a text tend to differ as I progress through these drafts. Initially, I make more substantive changes, adding new material, deleting irrelevant or redundant material, making major rearrangements in the order of the text. In later revisions, I tend to make more subtle changes, finding a more exact word, altering the structure of a sentence, making editorial corrections in surface features. Quite often, the differences between two late drafts may be so slight that under no circumstance would I have made such changes if making them would have required me to type a new copy of the text. Yet, as often, I recognize that such changes, subtle though they may be, have made a significant difference in the expression

and in the substance of my knowledge. Seeing ways to express more exactly what I am trying to convey, I permit myself to know my knowledge more precisely.

Writing on the computer allows me to write more drafts in less time and with less reluctance and allows me to separate my creative and critical skills more completely than I was ever able to do before. We should make every effort to offer our students these advantages. Perhaps when the typewriter was first available, teachers of writing felt some reluctance to learn to use it themselves and to teach their students to use it. Eventually, however, most teachers of writing learned that the typewriter was a better tool with which to write; it could help people write faster and better because it reduced the amount of labor required to transcribe the creations of the human mind. Typewriters became major writing tools and increased in sophistication from anual models to electric models to electronic models. The computer with a word processing program is only the next step in this evolutionary process.

Writing on computers is an appropriate first use of computers in English language arts classrooms. Undoubtedly a time will soon come when courseware will be developed that will suggest other uses of the computer to enhance the teaching and learning of language arts skills. But already the computer can help us and our students develop better and more productive relationships with the composing process.

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BASIC WRITERS AND THE COMPUTER

by
Linda Hunter

> "As a musician approaches a keyboard and works at combining notes until the sound is right, so a writer can approach the the computer and through word processing work at combining words and developing ideas until they look right--and read right."
>
> Marilyn Martin
> "Word Processing, How Will It Shape the Student Writer?
> Classroom Computer News
> 3:2 (November/December 1982) 74

Some of my colleagues in English seem to be very suspicious of computers. At last year's NCTE Conference in Minneapolis, Ed Farrell suggested that computers were going to be a part of the future of English teachers. Several members of the audience leaped to their feet to decry such inhumane developments. They seemed to assume that the computer was a sinister threat to humanistically oriented teachers. That may be a short-sighted view, ignoring the computer as a tool. Computers can be wonderfully humane for students and teachers, removing some of the drudgery often associated with acquiring proficiency in writing.

My first contact with text editing on a computer was, truthfully, against my will. Writing and the teaching thereof was my major interest; machinery was not. However, since I was just beginning a new job at the Academic Support Center at St. Olaf, and my boss said I needed to learn text editing well enough to teach it, I doggedly learned first the Edit system on UNIX, a time-sharing system, then was converted to PIE, a cursor-oriented editor, on Heath 89's. The work "converted" is perhaps the key to my attitude. Unbridled enthusiasm is characteristic of converts. My enthusiasm has been tempered a bit by a year's personal experience as well as that of students, but only a bit. I have become convinced that the computer's text editing can indeed be a humane instrument in the writing teacher's theme song, "Revise, revise, revise."

The reason for this theme song, of course, is that for most of us revision is at the heart of writing. I mean particularly internal revision, as Donald Murray calls it, when writers read and write drafts "to discover where their content, form, language, and voice have led them."[1] Often basic or remedial writers find that difficult in part because even they can't read their drafts. In addition sometimes the struggle to produce the first draft

has been so agonizing that another is unthinkable. Text editing appeared to me to be a splendid solution to both problems. Students could read the typed drafts readily, and with a few key strokes or simple commands could delete, add, move paragraphs, or correct a word misspelled throughout the paper. Revision simplified--the ideal motivator.

Several researchers are exploring the effect of word processing/text editing on revision. Richard Collier at Mount Royal College in Calgary, Alberta, tried to assess the difference between revision on a word processor/text editor and the traditional paper process. He worked with four first-year inexperienced writers using AES terminals over the course of six weeks. His results seemed to indicate little change in the actual nature of the revising strategies. However, he did note that the students entered into the revision process with the computer much more enthusiastically than when revising with the traditional method. He also noted that the text editing equipment itself, designed for highly sophisticated office work, was too complex and cumbersome for students.[2]

Lillian Bridwell at the University of Minnesota is doing much more extensive research in a three year project employing a more commonly used text editor, Wordstar, on Xerox microcomputers. She and her colleagues have developed two programs, one that yields "a time recording of the text and control keys the writer used to produce a text and one which enables (them) to do an 'instant replay' of the images the writer sees on the video screen."[3] Her conclusions will be far more definitive than mine.

My observations are the result of more informal research. I taught a course in remedial composition this past semester, requiring all papers to be written on the Heathkit H89's, using PIE and its companion formatter, much like TEXT, refined to be compatible with our main system at St. Olaf. I chose that system for two reasons: first, the college computer center staff recommended and supported it; second, because it was simple. I did not want to add to the burden students already felt as they approached the task of writing. The fact that the editor and the formatter are separate may be an asset, because the students are not then constrained by concern for "the pretty page" on the screen as they write.

Students in this course, English 10, had been screened by admission data and an essay exam required after they arrived on campus. The classes were small (no larger than 16) but perhaps more heterogeneous than one might expect. Four of my students came from private high schools, several from small towns, some from well-respected suburban high schools. In most cases they lacked experience with writing and/or interest. In a post evaluation of the course, six of the thirteen responding reported little or no previous interest in the subject. Two-thirds of them had no experience with computers either. Several were quite hostile at being placed in English 10. One student was severely learning-disabled. My hypothesis was that learning text editing would be useful not only in the writing and revision process, but also in building both confidence and morale as students mastered its techniques, even in this diverse group.

The course was structured by those of us teaching it to encourage a

great deal of writing and revision. The assignments were explained on Monday. On Wednesday students were required to bring drafts to small groups for discussion. Later in the week they brought in revised drafts for individual conferences with the instructors. Students turned in yet another revision the following Monday. In addition, an hour of writing workshop time was required, during which we worked with students on specific problems lifted from earlier papers. It seemed to me that a text-editor would clearly provide an advantage for a situation that required so much revision. At least I hoped that students would perceive the situation that way.

I spent one class period in the first week introducing students to the double disk Heathkit system set up in our Science Center. A cluster of them could be linked to a high quality Necwriter printer and/or the main frame computer simply by moving plugs. Students were required to buy two disks and the necessary documentation. This hour of orientation was the only formal instruction I conducted in text editing.

I did work individually with one student whose anxieties overwhelmed him. He motivated me to produce a simplified introductory set of instructions for the first steps because the multiple page documents intimidated my students at first. This could be caused by a correlation between weak reading and writing skills in these students, but I have no definite evidence of that. Laziness is another option. At any rate, two-thirds of the students came to appreciate the usefulness of the documentation according to the post course evaluation, but my simplified version did get some students started.

Four or five students quickly became the resident experts, important resources for the rest of the class. When one of them would tell me about trying a new technique using the computer such as the Search process or how to use the UNIX Spell program on his Heath programs, I'd ask that student to share briefly his knowledge with the other students at the end of the class. We also dealt with questions and problems in those few minutes. This sharing of techniques and tricks is typical of computer users who seem to have a very efficient underground instructional system. In addition, the computer center also staffed the cluster of Heaths with consultants during the busiest times of day for more complicated problems.

While I cannot document this statistically, within the first two or three weeks I was convinced I could see a change in attitude for several students who had been initially quite angry about their placement in English 10. I don't think that it is coincidental that about that time they began to master text editing.

Having smugly theorized how text editing had changed students' lives, I decided to ask them how they felt in a course-end evaluation to which I've referred earlier. It inquired about the usefulness of various computer functions for students as well as about their writing process and revising in particular. Fourteen students answered the survey.

First, the good news. Of course, all students reported that they used the computer for drafting papers, but four even used it for pre-writing. All

but one student would recommend text editing to a friend, and all but two had shown one or more friends how to use it. Ten of the fourteen had used it for other classes, certainly evidence of a positive attitude toward text editing.

Two-thirds of the students answering the survey were comfortable with the computer after the second paper. In fact, five students said that they spent three-fourths of their writing time on the computer, rather than on paper. In terms of motivation, three students found the computer their strongest encouragement for revision rather than either the small groups or conferences with the instructor; three more indicated that it was a strong encouragement.

With regard to specific writing and revision practices, the responses were not quite as glowing, although still encouraging. Most found the formatting and revision-enabling functions of the computer helpful, but less than half made much use of the computer's functions of moving chunks of text around or making global corrections. (However, the cursor-oriented editor and the fact that the papers were short may have made these functions seem unnecessary).

As I look forward to next year's group of English 10 students, I will plan some additional direct instruction about text editing, particularly on the intermediate level functions available. If students don't need them for my papers, they will for other courses.

The results of requiring text editing were also interesting when I compared evaluations with one of my colleagues who taught English 10 with the same format, but without text editing. Her students reported that time was the major factor hindering revision about as often as mine. However, perhaps their time was spent differently. While these students revised about as often as mine (from three to five times), about a third of her students did admit that the thought of recopying did prevent them from revising extensively, at least sometimes. Her students also claimed that they revised primarily on the word and sentence level. This, of course, is just what we expect of basic writers since the studies of Mina Shaughnessy, Janet Emig, and Nancy Sommers.

I didn't ask my students about specific levels of revising, but instead examined the "paper trail," as Lillian Bridwell calls it, comparing drafts from five randomly selected students. Paragraph addition, deletion, and change was about as frequent as word/sentence revision. If my colleague's students' evaluation of their revision and my survey is accurate, we may have a significant difference, possibly attributable to the computer. While my students were as frustrated by the time constraints, they may have spent their time in more complex revisions. Truthfully, the attractiveness of revising can tempt writers to spend much more time at it than can be easily imagined by those who haven't tried it.

Since one of my primary motivations for assigning text editing was to encourage revision, I carefully scrutinized the evaluations of the three students who claimed to revise only one or two times on each paper.

While one of them had used the computer before, none of them made much use of the somewhat more complex computer functions such as moving texts around that would have made revision easier. The two students who hadn't used the computer before were an interesting contrast. Student A wasn't comfortable on the computer till three-fourths of the course was over, one of the last three students to feel comfortable. That same student did show text editing to a friend and used the computer for other classes, but was the only student who wouldn't recommend my requiring it next year! He was most encouraged to revise by the small groups and conferences with me; he was discouraged by lack of time and lack of knowledge how.

Although Student B hadn't used the computer before either, she was comfortable after the second paper, true of most of the students. She was one of three students who found the computer a stronger encouragement to revise than either small groups or conferences. Her major block to revision was lack of interest.

Student C who had used the computer was comfortable with our text editor after the first paper. However, the computer was not his strongest encouragement for revision. Small groups and conferences had more impact; however, he was also plagued by lack of interest.

Unfortunately, no clear generalizations leap out. For Student A, text editing may have actually been a hindrance, but for Student B it was a plus. For Student C, it seemed to be neutral. His comfort on the computer didn't inspire him to revise to the degree I had hoped.

Happily, for most students, text editing was a more helpful tool. Certainly their attitude toward it was largely positive. We have some indication that it may encourage revision, and it also appears that students revise more extensively when the computer can facilitate that. In a forum in Classroom Computer News Jonathan Choate comments that teachers of writing expect more from students who have computers available for text editing.[4] Perhaps we can assume they encourage more extensive revision. On the other hand, text editing doesn't save so much time that it is no longer a factor in decisions to revise.

If this system of encouraging students to use text-editing sounds too spartan for many secondary schools, Tim Riordan, in the same November/December Classroom Computer News suggests a more supportive system. He suggests it for elementary students, but it seemed readily modifiable to me. First he suggests training a group of peer tutors to work on the computers. Rather than having the students who could not type put the drafts on the computer, he recommends volunteers - parents, typing students in a class. Then he suggests scheduling twenty minute editing sessions for pairs of students, one writer and one trained peer editor. He plans to give them some direction, encouraging positive response ("What idea, line, or paragraph did you like best?"), as well as suggestions to look for particular editing problems such as punctuation, or spelling. After the students work with those, Riordan also makes that set of revisions, he signs up to get a print-out of his paper. Modifications of this general idea make text-editing possible for students at nearly any level.

Text editing will not provide a panacea for the struggles of writing teachers. Basic writers will not automatically put more effort into revision because of it. Some of them will respond more to the computer's capabilities than others. However, learning its usefulness in a remedial composition course has benefits beyond those I anticipated. Computers promote precision since they are not tolerant of misplaced colons or commas, at least in the commands. Most importantly, students' self esteem can grow as they discover this powerful and humane tool for writing.

Endnotes

[1]Donald Murray, "Internal Revision: a Process of Discovery" Research on Composing, Points of Departure, ed. Charles R. Cooper, Lee Odell, NCTE, 1978.

[2]Richard M. Collier, "Text editors and the Revision Strategies of Inexperienced Writers," paper presented at the Northwest Regional Conference on the Teaching of English in the Two Year College, 1982.

[3]Lillian Bridwell, Paula Reed Narcarrow, Donald Ross, "The Writing Process and the Writing Machine: Current Research on Word Processor Relevant to the Teaching of Composition," New Directions in Composition Research, ed. Richard Beach and Lillian Bridwell (New York: Guilford Press), in press, publications summer, 1983.

[4]Henry F. Olds, et. al. "Word Processing, How Will It Shape the Student Writers," CCN Forum, Classroom Computer News 3:2 (November/December 1982) 25.

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USING COMPUTER PROGRAMS IN TECHNICAL WRITING CLASSES

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Drs. Joseph Mancuso and Thomas Irby introduced the computer programs Hypergraphics and Apple Writer to two classes in technical writing at North Texas State University during the fall semester 1982.[1] The instructors administered two questionnaires in an attempt to profile students in these classes and to quantify the acceptance/rejection by students of Hypergraphics and Apple Writer.

The instructors discovered that their sample of 54 students made high grades; worked at outside jobs; will use computers in their professional work; are presently familiar with some computer programs; write at average or above average levels; and favor learning about Hypergraphics and Apple Writer, the two computer programs introduced in this study.

When students of technical writing enter their professions, they will use computer programs to write, edit, and store technical reports. New professionals will also use computer programs to present technical information visually. Right now, technical writing courses do not develop skills to prepare students to perform these tasks. Hence, students are not as confident, prepared, or marketable as they might be. Further, employers accept an added burden in having to orient computer-illiterate, entry-level employees.

The authors will use the data in this present study to (a) design technical writing courses in which computer programs are used and (b) attract funding sources for computer hardware and software to be used in technical writing courses. The authors especially wished to profile current students in technical writing courses to determine academic competence, motivation, past experience with computers, likelihood of using computers on the job, and acceptance/rejection of Hypergraphics and Apple Writer.

Dr. Joseph Mancuso, Director of Technical Writing, developed the Minor in Technical Writing now offered through the English Department. Before coming to North Texas State University in 1981, Dr. Mancuso worked as a technical writer in government and industry for seven years. He taught writing courses at the University of North Carolina, Chapel Hill in the early 1970's.

Dr. Thomas Irby, formerly Director of Undergraduate Studies in the Department of Computer Sciences helped establish the Department of Computer Sciences at North Texas State University in 1971. Prior to that time, Dr. Irby worked in the computing industry for five years. Recently, he has worked with Dr. Darrell Ward to develop Hypergraphics, one of the computer programs used in this project.

Drs. Irby and Mancuso met a half a dozen times during the 1981-82 academic year to discuss the proposed Minor in Technical Writing and how that program might be utilized by Computer Sciences students. Both Dr. Irby and Dr. James Poirot, Chairman of Computer Sciences, offered suggestions for the design of the minor from the perspective of the many Computer Sciences students who would elect courses in the program. Dr. Mancuso and Dr. Irby exchanged information and developed a rapport which led to their agreement to conduct this study.

Technical Writing classes at NTSU emphasize the writing and editing of reports, manuals, proposals, and correspondence. The classes are taken by students from many disciplines including business, computer sciences, industrial technology, psychology, chemistry, English, and others. A Minor in Technical Writing is now offered by the Department of English and involves the following four courses which are described in the departmental brochure "A Minor in Technical Writing":

English 270 - Report Writing
- Learn fundamentals of technical writing style.
- Learn the documentation cycle in which technical documents are produced.
- Write components of technical reports: abstracts, executive summaries, introductions, feasibility sections, process descriptions.

English 316 - Technical Editing
- Edit rough drafts of technical manuals and other technical reports.
- Design technical reports.
- Learn rules governing technical writing style.

English 415 - Advanced Technical Writing
- Write one major proposal and supporting documents.
- Learn persuasive function of technical writing.
- Discuss mission of technical writer as information leader.

English 494 - Technical and Scientific Literature
- Trace technical writing style in nonfiction and fiction from beginnings to present.
- Forecast future directions for technical writing style.
- Examine issues confronting technological society.
- Discuss impact of scientist/engineer/executive as author.

Classes are complemented with presentations by North Dallas technical writers and personnel managers. These visits provide students with an opportunity to assess the profession of technical writing and the role of technical writing as a communication tool in many fields.

The computer programs introduced in the sample technical writing classes were Hypergraphics and Apple Writer.

Hypergraphics is a system which uses an Apple II microcomputer to develop and present lecture material. The system is used in a number of different courses in the NTSU Department of Computer Sciences and has proved to be an inexpensive but powerful communication tool.

Hypergraphics is implemented using an Apple II microcomputer with Pascal as a host language. A floppy disk is needed to store the course material. Each diskette will hold approximately 160 pages of material.

In the classroom, a large screen (50 inch) television display may be used. A display of this size is visible in a lecture hall accommodating 120 students. When Hypergraphics is used to generate material, a smaller television monitor is more appropriate, and a printer can be used to obtain hard copy of any material.

The curriculum material presented by Hypergraphics consists of page frames which can be displayed in predetermined or instructor-directed order. Each page frame consists of 20 lines of 40 characters each.[2]

Hypergraphics organizes lecture material as a network of consecutive page frames. Each page may contain up to ten references to other pages. Any of these eleven pages can be displayed by pressing single keys.

Usually the first page of each eleven-page set serves as a table of contents with references to pages that contain appropriate material.[3] Single keystroke selection of page frames allows the instructor to select the material rapidly as it is presented.

Apple Writer, a word processing program, is commercially available from Apple Computer, Inc., and can be used on an Apple II microcomputer to enter and exit textual material. Although the program is not as sophisticated as more expensive word-processing programs, it is an excellent choice for demonstrating the concepts of word-processing programs in the classroom.

Each instructor performed the following duties in this study: Dr. Mancuso constructed the first questionnaire, and Dr. Irby the second. Dr. Mancuso introduced the mechanics of the study to his students in one lecture and administered the first questionnaire at that time. In the second lecture, Dr. Irby demonstrated the use of Hypergraphics.

A question-and-answer period followed Dr. Irby's presentation, during which time the instructors fielded questions related to the applications of Hypergraphics in technical/scientific and other fields. The instructors found students' questions provocative, and enjoyed listening to their own shifting and complementary perspectives in articulating those answers.

In the third session, Dr. Mancuso lectured students on process description. He then asked students to write a process description incorporating the following sections: introduction, theory or principles of operation,

materials used, instructions for implementing the process, and trouble shooting measures. Students were requested to type their assignments and told that some of the process descriptions would be placed on Apple Writer which Dr. Irby would introduce in the fourth session.

Dr. Irby demonstrated the use of Apple Writer, a word processing program implemented on an Apple II microcomputer. At that time he also placed student assignments on the word processor. The lecture stressed that although initial capture of material on the word processor can be slightly more difficult and time-consuming than if the material were simply typed, the effort of subsequent changing and editing on the word-processor more than compensated for the initial loss of time.

In the fifth and final session, Dr. Mancuso returned process descriptions to students with corrections. A discussion of those corrections followed.

Both instructors were pleased with their joint effort. With little rehearsal, their coordination of class activities appeared fluid and even entertaining to students and themselves.

The first questionnaire, containing 31 items, was administered before Hypergraphics and Apple Writer were introduced; the second, containing 16 items, directly after both presentations. The first and second questionnaires follow. Cumulative results for most questions have been placed in parentheses on the questionnaires; results for some open-ended questions are discussed in results and conclusions at the end of the paper.

QUESTIONNAIRE #1

A Questionnaire Related to Computers for Students in Technical Writing Courses

DIRECTIONS: (1) Place name in upper right hand corner of each page of questionnaire. (2) Circle appropriate response to each question.

Questions that pertain to your schooling:

1. Type of high school you attended:
   rural (11) suburban (30) metropolitan (urban) (11)

2. Your classification at NTSU:
   Freshman (1) Sophomore (16) Junior (16) Senior (17) Graduate (4)

3. Your major:
   Business Computer Sciences English Other_____

4. Your minor:
   Technical Writing Business Math Other_____

5. Overall GAP: 2.0 (1) 2.5 (14) 3.0 (12) 3.5 (19) 4.0 (2)

6. GPA in Major: 2.0 (3) 2.5 (4) 3.0 (12) 3.5 (23) 4.0 (7)

Questions that pertain to communication courses:

7.	Have you taken other technical writing courses?	Yes (9) No (45)
8.	Have you taken one or more business communication courses?	Yes (14) No (40)
9.	Have you taken one or more journalism courses?	Yes (8) No (46)
10.	Have you taken one or more speech communication courses?	Yes (27) No (27)
11.	Rank your writing skills--a score of 5 signifying a high degree of writing proficiency (content, grammar, usage, correctness, organization)	1 2 3 4 5 (1) (27) (24) (2)

Questions that pertain to your employment:

12.	Do you work while attending NTSU?	Yes (31) No (23)
13.	Have you ever had a cooperative education placement?	Yes (6) No (48)
14.	What are your vocational-professional goals?	

Questions that pertain to computer programs:

15.	Have you taken one or more computer science courses?	Yes (29) No (25)
16.	Do you know the difference between computer software and hardware?	Yes (36) No (18)
17.	Do you know what the software (program) "Hypergraphics" is?	Yes (8) No (46)
18.	Have you ever seen "Hypergraphics" demonstrated?	Yes (6) No (49)
19.	Do you know what a word processor is?	Yes (41) No (13)
20.	Have you ever seen word processing software demonstrated?	Yes (18) No (36)
21.	Have you used a word processor?	Yes (10) No (44)
22.	Do you know what a mini computer is?	Yes (36) No (17)
23.	Do you know what a micro computer is?	Yes (30) No (24)
24.	Do you use a computer regularly (once per week or more)?	Yes (18) No (36)
25.	Do you expect to use computers in your vocation/profession?	Yes (46) No (8)
26.	Do you look forward to using computers in your vocation/profession?	Yes (43) No (11)

Questions that pertain to your attitudes:

27.	Describe your initial attitude in participating in this program.	Uninterested (3) Interested (34) Eager (14)
28.	Computers should be used in technical writing courses.	Yes (38) No (16)
29.	Computers are complicated and difficult to master.	Yes (17) No (37)
30.	Only students with a strong math background can learn to program computers.	Yes (2) No (52)
31.	Only students with a strong sense of logic can learn about the workings of computers.	Yes (23) No (31)

QUESTIONNAIRE #2

A Questionnaire Related to Computers for Students in Technical Writing Courses

DIRECTIONS: (1) Place name ir upper right hand corner of each page of questionnaire. (2) Circle appropriate response to each question.

1.	The use of Hypergraphics in the classroom is an improvement over other lecture methods.	Yes (47)	No (7)
2.	Slow speed of Hypergraphics is irritating.	Yes (3)	No (51)
3.	The display of the material was more readable than traditional techniques such as chalk board and overheads.	Yes (46)	No (6)
4.	When Hypergraphics is used, the notes should be available ahead of time.	Yes (38)	No (16)
5.	Hypergraphics is not a good classroom tool, and its use should be discouraged.	Yes (0)	No (54)
6.	Because of Hypergraphics I concentrated more on the material being presented rather than taking down words.	Yes (46)	No (8)
7.	The material was presented too fast because of Hypergraphics.	Yes (7)	No (47)
8.	Explain briefly how Hypergraphics can be improved.		

This section pertains to Apple Writer word processing software.

9.	Technical reports can be written and edited more effectively using word processing software.	Yes (54)	No (0)
10.	I think I would enjoy writing/editing technical reports more on the computer than in the conventional way in longhand.	Yes (54)	No (0)
11.	I think I would enjoy writing/editing technical reports more on the computer than I do typing them.	Yes (53)	No (1)
12.	List the advantages in using Apple Writer to produce technical reports.		
13.	List the disadvantages in using Apple Writer to produce technical reports.		
14.	Apple Writer is not a good classroom tool, and its use should be discouraged.	Yes (2)	No (52)
15.	Do you expect to use computers in your vocation/profession?	Yes (52)	No (2)
16.	Do you look forward to using computers in your vocation/profession?	Yes (51)	No (3)

The questionnaires revealed the following significant information concerning character traits, academic and vocational preparation, and attitudes of technical writing students in our sample. Conclusions drawn from selected results are underlined and follow a result or group of results:

1. Sixty-nine percent of the sample reported overall grade-point averages of 3.0 ("B") or above. Eighty-six percent reported grade-point averages in the major field at 3.0 or above.

Students in these two technical writing courses are generally talented, motivated, and hardworking. They demonstrate an academic competence associated with understanding computer programs.

2. Fifty-seven percent of the students work at part time or full time jobs while at NTSU.

This statistic underscores students' capacity for hard work. Technical writing students should, therefore, expend the necessary out-of-class energy in the microcomputer laboratory to master Hypergraphics, Apple Writer, and other computer programs.

Although their jobs are mainly unskilled or clerical, technical writing students are brought into contact with computers on the job and appreciate the importance of computer applications in business and industry.

3. Forty-six percent of all students in the sample are majoring in business, 22 percent in computer sciences, 9 percent in English, and 4 percent in industrial technology.

The fact that 68 percent of the sample will enter the fields of business and computer sciences lends support to one of our early assumptions: that the majority of students in technical writing classes are at least familiar with computer applications through their major field.

4. Over half the students have taken one or more computer science courses. In fact, 20 percent had already used a word processor.

Student fluency with computers is underscored by these statistics. Therefore, only a program-specific orientation should be needed for most students entering technical writing courses in which computer programs are used.

5. Students registered a high degree of acceptance of the use of computers in their vocations on the first questionnaire, before the introductory lectures. On the second questionnaire, after the lectures, 11 percent more of the sample reported that they expected to use computers on the job, and 15 percent more reported looking forward to using computers in their vocation/profession.

Technical writing courses in which computer programs are used can effect positive attitudinal changes toward the use of computers in the work place.

6. Nearly all students rated their writing proficiency as average or above average.

Students in both technical writing classes demonstrated this stated proficiency in report writing throughout the semester. Hence, more class time can be spent on mastering characteristics of good technical writing style--technical accuracy, conciseness, consistency, tone--rather than dwelling on grammar, usage, punctuation, and capitalization.

It should follow too that critiques by instructors of classroom reports will more closely approximate those made by superiors in the work place.

7. Students unanimously voted to use Apple Writer in their classes and their work. Further, students preferred word processing to conventional methods of writing and editing.

When technical reports are keyed into Apple Writer in technical writing classes, the results viewed on the video screen will show problems of style and substance in the same acceptable manner--as they will be viewed in the work place.

8. Students responded positively to Hypergraphics, acknowledging the following characteristics of the program: presentation speed, readability of the material, ability to concentrate on the lecturer rather than taking notes, versatility of the presentation.

Because of the students' high degree of acceptance of Hypergraphics, this program can be successfully used by instructors to present technical writing lectures to students. Students will also learn to use Hypergraphics to make their own technical presentations.

Technical writing courses can be a prime instrument for developing strong writing skills in students. Technical writing courses can go one step further by acquainting students with the latest computer technology, so that students may write, edit, and store technical information and also present that information concisely and dramatically.

The acquisition of these state-of-the-art writing skills can help students to gain greater confidence and become more marketable as entry-level job candidates. Also, employers save time and energy when the indoctrination period for any employee is lessened. And these savings may be passed on to the universities in terms of funding, and contributions of equipment and human resources.

ENDNOTES

[1]The classes were English 270 - Report Writing, and English 416 - Advanced Technical Writing.

[2]Hypergraphics's character set contains both upper and lower case characters and a number of special characters. The special characters include most of the normal punctuation characters plus an array of line segments which allow the user to create block drawings and other images. Individual characters can be redefined by the user so that symbols specific to any discipline can be displayed.

[3]Each table-of-contents page can also refer to five Pascal programs. If these Pascal programs are designed to chain back to Hypergraphics, the same table of contents page is displayed when the referenced Pascal program finishes.

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TWO-POINT-FIVE CHEERS: THE COMPUTERS ARE COMING

by
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It was interesting recently to attend the Conference on College Composition and Communication and to hear in the sessions, the restaurants, and the bars how excited English teachers have suddenly become about computers. This special issue of FOCUS is another evidence of the interest. For years English departments have been computer-free. Or, at best, they might have one or two younger faculty members who knew something about how to use the campus computer system--much to the astonishment and perhaps skepticism of their colleagues. I remember visiting one state university campus three years ago and discovering a thoroughly dust-covered terminal in the department office. "Broken?", I asked. "No, we just don't have anyone here who knows how to use it," the Chairman replied. And indeed I remember that as recently as eight years ago the Chairman of my own department advised our one computer-using younger colleague to quit fooling around with all of that computer programming stuff and to get on with proper scholarship.

Times, it seems, are changing. With the marketing of powerful, inexpensive, "user-friendly" Apples, IBM-PC's, TRS-80's, and a host of other machines, English teachers and English departments seem to have "caught the computer bug." The halls are beginning to be filled with talk of bits and bytes and nested loops and spelling-checkers and double-density, double-sided, dual disk drives. For a group whose stereotype is the pipe-smoking, leather-patched anti-technologist, all of this is quite astonishing, and most astonishing of all, many traditionally conservative department administrations are now getting serious about acquiring computer equipment and people who can really use it.

As a computer user myself, and as the Chairman of a department which has introduced a lot of computer technology within the past three years, I view this shift as an overdue change, an exciting marriage of technology with research and teaching concerned with language. It is a quiet revolution, a liberating new stage in education, and in rhetoric, linguistics, and literary research it is , I believe, a promising development. Yet I would admit that this "great leap forward" is not without its "few steps back." In this paper I would like to acknowledge both by telling you a bit about the experience of my department since it brought in the computers. I am going to concentrate entirely upon the impact of those computers on the faculty and staff in their offices, leaving for another time the discussion of the effect of computers in the classroom.

First, a little background.

Our department, the Humanities Department of the University of Michigan's Engineering College, had only three computers three years ago. They were an Apple II, a Decwriter II terminal to our main-frame computer, and a Xycom Rac-Pac. Two faculty members and one secretary were the only ones who knew how to use these machines, and in fact the Apple had never been used because nobody had time to get it set up and running. Thus three years ago the Apple was unused, the Decwriter II was used primarily for tutoring students in grammar; and the Xycom processed files of departmental vitae, as well as the text of a number of chapters and articles for approximately five members of the faculty who had begun to discover that this machine could make their work easier if they simply had the secretary type papers on it rather than on the Selectric typewriters. With our one knowledgable secretary, we also published a journal, The Tennessee Williams Review, with camera-ready pages printed out on our printer. (The journal's editor knew nothing of the process and depended entirely upon the secretary to produce the journal from the draft manuscript.) Of course we had other terminals available to us too, but they are a block away in the computing center or down in the basement, so in effect we had three computers and three computer users--a fairly typical English department situation, I think.

Then we got a new Dean. He was 38 years old, a "high-tech" person, an avid computer user who has two machines at home and an office that looks like the cockpit of a 747. He types at over 100 words per minute and is a master at lifting useful things out of data bases and from disks as he composes a torrent of documents, analyses, statistics, and computer-generated graphics.

The time seemed right to put the bite on for some computer equipment!

The equipment which we have acquired in two years--some from the Dean and some from our own hustling-- consists of IBM Personal Computers for approximately one-third of our faculty and for all of our office staff of four. The machines are equipped with modems to permit them to be used as terminals onto the main university computer, but they also have their own printers--some dot-matrix and some letter-quality-- so they can also be used as stand-alone systems. They are located on the desks of all of the current faculty users as well as in a special computer room which we have set up in the central office. In addition, through a grant, we were able to hire a Lecturer to teach a special, summer-long PASCAL programming course for our faculty and to pay the participating faculty, some nine of us, stipends of $1500 each to participate. We have also hired a graduate student on a quarter-time appointment to serve as our technician and guru. In all, then, we went from three users and three machines to fourteen users and ten machines in a little less than two years. And through proposals we are still trying to acquire more machines and to increase our range of users and uses.

Now, what have been the results so far of the coming of these computers?

The positive results are the obvious ones. After all, computers are supposed to speed work, to improve quality, and to make routine tasks greatly more efficient. And indeed that seems to have been the case with us.

Take, for example, those department vitae (as well as all course descriptions, syllabi, and class handouts). As recently as five years ago our vitae were updated once each year, over the summertime. A secretary spent most of May and often beyond in retyping every single page of the vitae

of all faculty members. In some cases there were few changes, but in other cases the task went on and on--as in the case of one of our more prolific faculty members whose current vita is 35 pages long. Every line, every entry got retyped once each year. Surely it must have been the most numbing job in the world, and it naturally produced error-filled vitae in which the errors of last year were compounded by the new errors of this year.

Now all of that is computerized. Vitae are still retyped, but now the secretary has only to enter the changes and the machine does all of the typing. And we now have vitae current to within the month, because it takes only a few hours for a secretary to enter all the new material and to print out a new set. We even find that several faculty members have copied out their vita files from the main computer and have produced their own streamlined and tailor-made vitae for use with grant applications and the like, often keeping several different versions current to within a week.

Or take the typing of articles, chapters, and papers. It used to be that we had a secretary who did nothing but type second or third draft copy and all the subsequent drafts of our papers. Every draft took out some mistakes but introduced others; the typist was bored; faculty felt guilty about asking to have it typed "one more time;" and the result was that we usually sent out less-than-final draft copy only to find the inevitable errors when the articles appeared in print.

Now with computerization most of us compose at the keyboard and have eliminated the messy, unreadable first and second drafts which we used to hand over for deciphering and typing by our secretary. We have also eliminated the problem of the newly-introduced error. But most importantly we have allowed ourselves the luxury of having just as many drafts of a document as we might wish. No document is ever a "final draft" and I think most of us would agree that while we used to go from blank page to print in three or four drafts, now we routinely do eight, ten, and more drafts--from first draft to final draft, controlling the whole process ourselves. I think we agree that we are producing better work, producing it with a great deal less effort, producing more of it, and producing it without driving a secretary into the ground with endless routine typing.

Or take the administration of the department. For example, we used to spend weeks figuring out the budget, adjusting it upward or downward by a tenth of a percentage point or shifting a few dollars from one column to another in an attempt to balance it perfectly. Now we can do all of that in minutes. We can calculate ten or twelve alternative budgets in considerably less time than it used to take just to record our final budget after it had been calculated. And we can monitor types of budget information which it was never possible for us to monitor before. This not only allows us to use our money more efficiently than in the past, it frees us from spending time in dreary, endless calculations and allows us to put that time te more interesting and profitable uses--like taking that PASCAL course which I mentioned earlier.

The comments of the people are indicative of these gains: Says our secretary, "Some people still don't put their stuff on the computer, but those that do can make changes that they wouldn't have made a few years ago because they would have felt guilty to ask me to do it." She goes on, "Not typing the same thing over and over--that's great. It makes my job more

challenging, more interesting. I spend about three hours at the terminal a day, and I find it gives me a break. It's fun."

Our Administrative Assistant comments, "At first it didn't save me time because I was always checking myself and it took time to set up my work, but now I can put the whole picture on the computer; I can see things I couldn't see before. I spend no more than ten hours per week at the terminal, but it has changed my work. It has even changed our language!"

Our Principal Secretary adds this: "The computers have freed a great deal of time for us to do more interesting and creative things. Perhaps the novelty will wear off, but spending less time doing routine things has made my job much more interesting."

And a faculty member comments, " My productivity has doubled--well, maybe that's a little hyperbolic, but I have been spending about four hours per day at the terminal writing. I have become addicted to it because it 'un-paralyzes' me and allows me to play with options when I write. It makes it easier to compose and much less anxiety-producing. I have been coming in a lot at night and on weekends, and I have found myself so eager to get stuff out that I get frustrated when anything stands in the way. I even make bungling errors and have done dumb things because I don't want to take to time out to really learn how to use the computer well. I am satisfied to be 80% efficient."

Another adds, "For the first time in a long while I had to use the typewriter last night--to fill out a form. I used correcto-tape, eraser, and white-out, and it took me an hour to fill out one lousy form; I couldn't believe it. Using a computer you can really rip things out, but you can also produce attractive, polished copy. It speeds up and improves written communication."

These are of course isolated comments, but perhaps they do convey the sense which all of us feel. With computers we are working harder at things we find interesting; we are spending less time doing tedious, uninteresting jobs; and we have all come to feel that it would be quite impossible to go to a job where we no longer had access to computer equipment: we just cannot imagine working without it.

Now, as I said, that is the obvious, positive side of the computer revolution as seen from this department's offices. There are, however, less obvious and less positive effects as well.

One undesirable effect of computerization has been a loss of control by the office secretaries. Documents get written, typed, and sent out without ever passing through the central office. As a result, there is little opportunity for an overview, and each faculty member has become less able to depend upon someone else to remember what happened to that letter or which draft of the paper got mailed out and when; we have become more vulnerable. The Principal Secretary comments, " It is possible for us never to have seen a copy of a document--not only possible, it happens. We used to have the ultimate control; now we have none. We used to open your mail and to type everything going out; now we don't know what you are doing. And the chronological file? Well, that's a joke."

Thus we have faculty assuming the tasks that used to be done by secretaries—some of them--and in some cases doing a good job of it, but in other cases doing it badly. In the meantime, the secretaries are finding new jobs to do. The Principal Secretary sees all of the office jobs as having been upgraded--naturally with no increase in pay. Yet paradoxically we still need someone "at the bottom" to do the routine jobs like getting the mail and running the copy machine. And we still need a "chain of command" to assure the efficient integration of secretarial and faculty work. Yet just as computers have changed the secretarial work, they have reduced both that "bottom end" control and the hierarchical control that used to be typical in a pre-computer office. This creates confusion and even friction over job roles--particularly since the office staff have now been put into very different relationships with different faculty members. On the one hand they must perform the traditional service role for some faculty members; yet on the other hand they must perform a completely different role for other faculty members whose work, because of computers, has been changed. I sense that computerization, particularly partial computerization, has caused a perplexing redefinition of both faculty and secretarial roles. Another way of saying that is to consider what one would post as job requirements for a new secretary. Would they be the same in 1983 as in 1980? Without question, in our office the answer would be no. With computerization, we have much less need now than we had just three years ago for a clerk-typist, although that need still exists too for some of our faculty. Rather, to work effectively with our computer-using faculty we need someone who combines technical support skills with coordinating and administrative support skills. It seems to me that the needs are quite different--and much more demanding.

Another unforseen side-effect of the introduction of computers is that we have found a new, and seemingly endless way to spend our limited departmental money. Whereas a year ago we were able to use our departmental discretionary funds for a travel budget of a little over $6000, this year--even though our funding has been steady-state--we have found that the computers have gobbled up an astonishing portion of our available money. Disks, form-feed paper, thimbles, ribbons, cables, repair work, and on and on. Indeed, it astonishes me to discover in May that although we are not yet done with the budget year, we have spent $3621 to operate our computers for the year and consequently have had a great deal less money to use for other and more traditional uses like travel and long-distance phone calling. To give you an idea of the exponential growth of this new and apparently limitless way of spending money, we had budgeted $450 for the year, using our spending of the previous year as a basis for projection. A bill of $3621 and a budget of $450! certainly a prescription for reordered spending priorities, and a source of concern for everyone involved. (And of course I am ignoring the fact that we spent over $30,000 on new equipment in the last two years as well, most of it from funds "hustled" here and there.)

So substantial is this problem that we have completely revised our policies on spending. Instead of a travel policy and a phone policy and a mailing policy, etc., we adopted a "resource allocation" policy under which faculty members may choose for themselves how to spend what little money we have. If it is more important to them to have a new software package than to take a trip or make long-distance phone calls--OK, that's their choice. And interestingly we have found that the travel and long-distance calling budgets have fallen this year, while the computer-related spending has jumped substantially. Of course you could argue that the spending is necessary and

justifiable--and in a sense it is. Yet on steady-state budgets, computerizing a department may well force reordering of professional priorities in a way that is neither easy nor without the potential for dissonance.

Like cars and television sets and dishwashers, this new "essential" convenience, the computer, is a costly appliance that may have to be paid for out of "the food budget." Not an easy choice under any circumstances, and especially difficult because one's sense of what is "essential" seems just to keep climbing. Two years ago I was satisfied with an inexpensive dot-matrix printer for my own three-year-old machine. This year, not only did I replace the machine itself (at about $4000), I decided that I just had to have a new letter-quality printer (at $2150). It reminds me very much of the fact that when my family bought its first "second car," it was a $100 clunker that just managed to get me back and forth to the office; now we have to have something more elegant and the most recent "second car" in our family cost $5700. You too may have personally experienced the dilemma posed by rising expectations and fixed budget; as a department we are experiencing it now.

A final negative side effect of the coming of the computers has been what I would describe as the "glued to the tube" phenomenon. Although it is perhaps balanced by greater productivity and job satisfaction for both faculty and staff users, we find that indeed we are increasingly isolating ourselves and quietly working away at the screen. Before computerization, there was a lot of coming and going, a lot of conversation, a lot of personal interaction. After computerization, there seems to be less of that. Most of the users agree that there is something absorbing about working at the screen, something almost hypnotic about it. We sit for two, three, even four hours at a stretch, using and learning new ways to use these machines. Our backs may ache and our eyes may strain--and they do--but the time flies by as we sit clicking away, almost oblivious to what is going on around us. Many times I have been astonished to discover that three or four hours have gone by without my once being aware of much beyond that little glowing rectangle in front of me. I seem to resent the interruptions of people and phone calls more than I ever did when I worked on paper, and I am spending a great many more hours in the office than I ever have in my life. I come in at 7:30 AM and leave at 6:00 PM on weekdays, returning again on Saturdays and Sundays for not much less time. And I am not alone in that. The other computer users are usually here too, each pecking away in his or her own office when many of the other offices are dark. It is not that the computer users are doing more work; it is just that they are doing it in a different way, a way that takes us out of our home studies and causes us to sit for hours in one place almost without moving. I am certain it cannot be a healthy thing, and in some sense it seems a loss in terms of the quality of our work lives. I may be writing twice as much as I have ever written in my life, but I also have a pain between my shoulder blades, a pain much like the ones I used to get when I worked summers in construction. Progress? Well, maybe.

In many English departments the computers are coming; in our department they are already here--although I am certain other departments may have had more experience with them than we have in our short time since their vigorous introduction. My sense so far is that these machines are necessary, inevitable, wonderful tools to be used to expand and improve the nature of our work. Yet at the same time they unquestionably redefine our ways of working, our office organizations, our priorities, our budgets, our very

lives. As one of our faculty members said, "I can now do things I couldn't do before, but my computer has complicated my work. I have to learn new things--Text-edit, Tele-Graph, PASCAL, Visi-Calc--some things I might not even use myself, but I have to learn them in order to understand what can be done. I can't imagine working without a computer, any more than I can now remember how we managed to work without photocopy machines. Still, I sometimes feel I am at a dead run just to stay where I am. I like to read the book review section of the New York Times; now I also have to find time in my life to read the software reviews in Personal Computing Age. That's progress. Right?"

P.S. Used in this paper are 3621 words, 1001 of them different. On the first run-through, the spelling-checker identified 85 of them as misspelled: however, all of these turned out to be simply words not in the spelling-checker's 21,026 word "dictionary," and thus unrecognizable. In all, 15,339 words were checked in five minutes. I am sure most of us would agree that spelling-checkers do not represent an enormous technological advance, but they nicely illustrate one reason we are enjoying using our new computers.

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GETTING ON THE COMPUTER BANDWAGON

by

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As technical editor for a software firm in the late 1970's, I devised a survey of computer knowledgeability that I never got around to using. In academia now and involved with both English education and computers, I revised the survey recently (summer 1982) and used it by mail and telephone and in person, with some surprising results. Of nearly one hundred respondents, all English teachers from elementary to college level, only 19 claimed extensive familiarity with the operation of microcomputers and word-processors; roughly 30 said they had adequate familiarity with one (usually word-processing) or both; and the rest, nearly one half, had little or no familiarity. In this last group, almost 100% said that they wanted to learn more but, for a variety of reasons, had not been able to. Hence this introductory article.

The bulk of my remarks will be about microcomputers and their accessories rather than about large installations, the mainframe-terminal matrix. Currently the thrust in education and elsewhere is toward freestanding (off-line) units that are easily set up and accessed. Moreover, as both ROM and RAM memory (more on these new terms as we go along) increase, so does the amount of it devoted to built-in aid for the user via on-screen "menus" or instruction lists.

But these trends should not be taken as encouragement for English teachers to sit back and let computing come to them. There are still some basic terms and concepts that need to be understood for effective, up-to-date instruction and communication. Luckily, it is not too late at all to climb aboard the great computer bandwagon.

WHAT TO KNOW ABOUT . . .

Consoles. In the world of computers, this term refers to the computing device itself, the central processing unit (CPU), plus its integral memory units and the housing. There are dozens and dozens of consoles on the market, most of them about the size and appearance of a large electric typewriter. The models most commonly in use in and out of academia are versions of the Apple, the IBM-PC, and the TRS-80; these are likely to remain in the forefront, if only because so much software is written for them. If you had a console in front of you, you would see the difference between its keyboard and that of a typewriter --some extra, coded keys to aid with programming and machine-response. The disk drive, characterized by one or two horizontal or vertical slots (in the console or in a separate small box)accepts diskettes for programming and software use. Along the sides and back you would also find a number of electronic "ports" to facilitate the addition of accessories, or peripherals. The price of microcomputer consoles ranges from a few hundred to a few thousand dollars, depending primarily upon the extent of the built-in capabilities.

Peripherals. The television-like device that sits on top of or beside (or is housed with) the console and is connected to it by at least one cable is called, usually, the monitor. In its most common form it is a 9-inch to 13-inch screen whose display can be scrolled up and down electronically. Essential to computing, monitors can hardly be termed peripheral devices, yet they are often sold as extras when one purchases a micro. They come with color display or the less expensive green-screen. Other important peripherals are extra-memory

devices (like plug-in RAM packs) and printers. The former of these allow you to run sophisticated software or write complex programs, while the latter provides hard copy of whatever is written on the monitor or in some part of the system's storage. Other accessories range from digitizing tablets to telecommunications interfaces, but only a few of them turn out to be, in the long run, necessary for basic educational computing.

Memory. A computer's potential is measured primarily by its capacity to store and retrieve information--its memory. There are two kinds of primary memory, read-only (ROM) and random-access (RAM). ROM is for information, routines, and capabilities written in at the factory; stored permanently, these cannot be altered. RAM is for new information that the user wishes to write into and/or read out of the computer as often as necessary; it is fully changeable. Information is generally transferred into and out of primary memory as data in the form of bytes, each one roughly equivalent, in the macro world, to a single typed character. A typical micro has a RAM capacity of 16 to 64 K (kilobytes). In educational circles, the standard secondary-storage medium for using RAM--i.e., for transferring data in and out (saving programs and operating software)--is the 5¼-inch diskette, a flexible platter of Mylar plastic with information stored in its magnetized concentric tracks and retrievable by a recording head. Usually, to operate a microcomputer, you begin by inserting one or two diskettes into the slots of the disk drive. Now you can tell the system what to do--or vice-versa.

Software and Courseware. If consoles and printers are hardware, the prepared programs that they work with are software, available on diskettes. Software designed to teach in an orderly sequence of lessons is called courseware. Currently much of the courseware on the educational market is made for use with Apple II and IIe microcomputers. Given the variety of program statements and commands, and the skill needed to arrange these in proper combinations, one is best advised to leave programming per se to professionals. Still, as I hope to demonstrate, simple programming is within reach, and doing it helps to demystify computing in general and thus allow educators to have their say on what is to be programmed. A midway point between writing your own and buying ready-to-run is software and courseware that helps you write through on-screen instruction, such as the Pilot series. The place to start sorting through the software maze is an updated resources catalog, such as the Index to Computer Based Learning.

Word-Processors. The product of the marriage of microcomputer and typewriter, a dedicated word-processor is a veritable stupor mundi for those who work with language; once mastered, it can do everything but think up things to say, including grammar and spelling checks. The trick here is machine-mastery, and even an expert typist needs considerable time to adjust; office-type models tend also to be relatively expensive. A better route for most individuals or small departments would be the multi-use micro with add-on word-processing program. This configuration may not do quite as much quite as fast as, say, a $7000 CPT-8520, but it will be easier to learn ("friendlier") and a lot cheaper. Combined with a daisy-wheel printer, it can produce quite acceptable hard copy as well as handle mailing lists and perform microcomputer operations.

Magazines. While no journals exist solely for English teachers, two academic journals, Educational Technology and AEDS Journal, provide a steady stream of microcomputing ideas and applications; most school and university libraries carry these and others of the same disposition. Likewise, two popular magazines

dominate an increasingly crowded rack--Creative Computing and Popular Computing. Some of these monthlies run to over 300 pages each issue, and you can learn as much from the many ads as from the text. In the realm of weeklies and newsletters, Info World leads the way with up-to-the-minute ideas and developments. In such publications, the serious reader can find not only facts and evaluations but also listed programs that will run on the micro for which they were written; they will also tell you, sometimes, how to get these programs to run on a variety of micros through special adaptation cards that fit into peripheral slots. Things are never quite as simple as they seem--especially in computing.

Books. The most valuable book you can own is the one that comes with the microcomputer--the instruction manual. Some of these are muddled in places, but others, such as the one for Apple IIe, are models of clarity. Most manuals even present a short course in BASIC, the most popular microcomputer language, an example of which appears below. Lacking such a manual, you will find the best bet to be purchase of an introductory treatment of computing, such as the paperbacks Peanut Butter and Jelly Guide to Computers by Willis and Making BASIC Work for You by deRossi. A caveat here is that unless the book is updated in successive editions it can quickly become obsolete in one way or another. Texts typically available in university bookstores tend to tell you much more than you really need to know.

Owning a Microcomputer. If you can envision yourself making practical home and office use of a microcomputer, and you can afford to lay out $800+ to develop those uses, then by all means take the plunge. There is no more efficient way to learn than to have the machine and its manual right there in your office or den. In-person help is often available, too, in the form of individuals or users groups who know your model and can offer advice. Besides, tuning in, in real terms, to something so essential to our times is enjoyable in its own right. Do bear in mind, however, that the console-screen matrix may be only half of what you need, especially if you plan on editing and printing texts electronically. One way to justify the cost of word-processing accessories is to convince yourself that you need a new typewriter. You will end up with something much better.

A SAMPLE PROGRAM

The most difficult part of computing is not writing programs; it is writing programs without bugs--those little things that, when they go wrong, can make a big difference in the way programs run. But, bugs or no bugs, just the attempt to compose your own flowchart and/or listing often turns out to be one of those experiences that is more rewarding than punitive, like jogging five or six miles in the rain. Before you get scared off, though, please read on--that much, at least, will be worth the effort. And you may get hooked.

What follows is a sample unit (plus a bit more) from a short instructional program that is free of error. It includes BASIC statements and commands that instructors ought to know, as well as some explanation of important operations like input and branching. Although I claim neither real expertise for myself nor great significance for this sample, it was a start for me and could be the same for you.

First, the listing:

```
NUMBER 5,5
05 CALL CLEAR
10 PRINT ,"TEST PROGRAM"::
15 PRINT "Enter past tense of the verb TO DRAW:"
```

```
20 PRINT
25 LET C=ø
30 PRINT "The foreman ..... up a new layout for the plant."
35 INPUT "Verb?  Type in and press ENTER or RETURN.";V$
40 IF V$="drew" THEN 75
45 LET C=C+1
50 IF C> 2 THEN 65
55 PRINT "Sorry, try again:"
60 GOTO 35
65 PRINT "The correct answer is DREW.  See p.34 in grammar book or your
       instructor. Type CONTINUE to go on."
70 GOTO 80
75 PRINT ,"--is correct!  Type CONTINUE and go on, brainy."
80 BREAK
85 PRINT
90 PRINT "Which choice is correct?";:
95 LET C=ø  [optional with multiple-choice]
100 PRINT "The word that both begins a clause and makes it dependent is
       called A. an adjective B. a subordinator C. a preposition."
105 INPUT "Your choice?  Type in A, B, or C and press ENTER or RETURN.";CH$
```

et cetera

When a student runs this grammar-drill program--i.e., punches in RUN--the screen displays (without line number) the quoted parts of lines 15, 30, and 35. Signified by a question mark, INPUT lines require a response. In this case, since the variable listed in the program (V$) is terminated by a dollar-sign code, the CPU is awaiting a "string"--here, a word. If the string typed in (let's say "drawed") does not agree with the one specified in line 40, the display returns to the INPUT line (35) via lines 55 and 60 and does so for as many times as are specified in the counter, lines 25, 45, and 50; it is wise to limit incorrect responses to two or (as is done here) three. Upon the third wrong answer, the screen displays the message in line 65, which could also have been a full explanation. After the student is enlightened, CONTINUE jumps the program to the next unit, of which lines 90-105 represent the start. If the student had responded correctly before try three, the computer would have branched directly to the congratulatory reinforcement in line 75.

The NUMBER command at the beginning of the program tells the computer to enter a numbered line each five lines; the skipped lines (e.g., 16, 17, 18, 19) are for possible emendations. Empty PRINT lines (20,85) create space for a neater screen display, as do a few of the commas and colons. Although there are many ways in which to set up and dramatize a lesson (including graphics--but that is another story), I must reiterate the obvious: the above is intended as a simple yet informative example. If it happens to ignite interest in you, then it has served its purpose.

Moreover, if this article has given you what you need to know to become interested, if not hooked, on the micro scene in general, its author rests contented. You and he both know that, increasingly these days, getting on board the computer bandwagon is more a matter of survival than choice.

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WHAT DO YOU DO WITH YOUR COMPUTER WHEN YOU GET IT?

by
William Marling

For two years the English Department of Case Western Reserve University has been using micro and mainframe computers in classroom applications. We have attempted a variety of projects, from a program called "Hamlet: the game that teaches the classic" employing our mainframe's power, to grammar drills, with which we all are too familiar.

Our interest came to rest, eventually, on how we could use microcomputers to reduce the repetitive and boring aspects of teaching and grading writing. There are "boilerplate" definitions and corrections that writing teachers make over and over, and we thought that if we could write a program to insert these into student essays easily we would save time and increase the information that we put before our students.

The programs that we wrote were called WRITER, GRADER and READER, and were a text editor, a grading program and a grammar book respectively. The key program, GRADER, allows the teacher to grade essays written on floppy disks and to make all corrections and marginal/end commentary that he or she would make on paper. Corrections are mnemonically cued to the computer's function keys, which the student pushes to read the appropriate "pages" of the READER electronic grammar book. The whole system is "paperless" and, while not perfect, it approaches the programming limits of grading on a microcomputer. The results, and logistics involved in obtaining them, are instructive for those who have recently begun to work in this field or are contemplating microcomputer purchases.

We tested our software in two controlled classroom experiments. The first of these, in the fall of 1982, allowed us to master the problems involving in teaching students to write with a text editor (WRITER) and the logistics of a "paperless" class. In sum, we found that advanced writers can save a lot of time--about 30%--when they use microcomputers. Of the logistics, more later.

In the spring semester of 1983, we performed the same experiment in a freshman English class, introducing the GRADER grading program and the READER grammar program. The class was randomly divided into a user and a control group. The user group was given no instruction except that in the manual supplied to the fall semester class, although we updated and simplified the manual on the basis of the first experience. Users were assigned two guaranteed hours of computer time a week; they could also drop in and use the machines any time they were not in use. Immediately we discovered that freshmen needed more hours of computer time; two and even three hours

were sometimes not enough. We found freshmen undisciplined about doing their writing in their assigned periods. They waited until the day before the assignments were due, at which point they all wanted to use the machines in the same three hour block of unassigned time. They waited until five minutes before class to make hard copies of their papers, resulting in a queue before the printer that did not end until ten minutes into the class period. All of this shows, I suppose, that freshmen will continue to be freshmen, even in the computer age, and provide us with a familiar touchstone.

The results with the freshmen were much different and complicated my views of what could be done with microcomputers. Here are the statistics for the first ten papers:

Paper	Control	Users	
1		100	105 (Table Time as 5)
2	rewrite 1	100	124
3		100	122
4	rewrite 3	100	132
5		100	108
6	rewrite 5	100	97
7		100	99
8		100	88
9		100	88
10		100	67

We find several important differences in these results.

1) There is a much longer learning curve for naive users. It takes them five weeks, or perhaps five assignments, to learn to use the machine. Not until the sixth or seventh week have they learned enough and become comfortable enough to operate more efficiently than the control group. Since many freshman English classes last only ten weeks, and since many have no more than seven or eight assignments, the wisdom of using micros in them is open to question. There had better be other, important advantages.

2) In this class, as in the first, rewrites took relatively longer for the user group to write than for the control group, at least through the six week/six assignment learning period. This happened in spite of an assignment (number three) that was a "process" paper about using the "search and replace" function of WRITER. In other words, we forced them to learn fairly sophisticated operations early on in the class. Like other experiment subjects, students seek the least complicated route through the maze, even if it is not the quickest one.

3) There is no comfortable learning curve that begins high and gradually drops lower. Rather it begins low, suggesting the excitement and/or limited knowledge involved in initial use. It moves gradually higher. I can only hazard a guess that it has to do with working at the public terminal site, since 90 percent of the user group writes there. Loud noise and the presence of friends, who are doing untimed work, produce distractions that don't affect control group members working alone at typewriters. I saw one instance that is graphic evidence of this. One night I found one of the better students in the user group at the public terminal site; he was writing his

English paper on the micro, and he was logged into the time-sharing terminal right next to it. The time-sharing computer had a very slow response time. While he was waiting for the system to respond to his APL homework, he wrote his English paper and offered advice to friends doing their APL homework.

GRADER was not as fast as we thought it would be. So far it has only twice graded a batch of papers faster than hand-grading. It averages about 8 percent longer, though on occasion it has come within 4-5 percent.

Paper	Control	Users
1	100	105 (grading time as
2	100	119 % of control time.)
3	100	110
4	100	114
5	100	105
6	100	104
7	100	115
8	100	88
9	100	106
10	100	98

With improvements in the speed of the GRADER program's I/O routines, this average could be reduced to 2-3 percent above manual grading time. I'm skeptical that it can go much lower than that simply because of the physical limitations of grading on a screen.

We have not thrown up our hands in disgust at spending all the extra time grading disks, because there are several obvious advantages. Foremost among these is that the student has error mnemonics that allow him to key each error into an electronic grammar book. We have not tracked number and type of errors in the user and control groups, but our impression is that we are seeing fewer errors in the user group of late and about the same number in the control group. A second advantage of GRADER is that it preserves all error codes, and all end and marginal commentary for later review. This is a tremendous aid at the end of a semester, when you are evaluating a student's progress. It makes conferences with students about their "progress", or lack thereof, incredibly direct and to the point. What we usually do is scroll through the error totals for a series of papers without saying a word, letting the student judge his own progress. When they leave later, most walk out muttering "Jeez, I'm got to do something about that..." Finally, having such information stored allows the teacher to profile a student's performance on the basics over a semester. The number of, say, comma errors that a student makes over a semester can be charted. Or perhaps the problem is the teacher's: in that event, since comma errors are stored at the same place in each file, he can graph the classes' comma errors over the semester--and gain some perspective on his own teaching efficacy in that area. The software that displays these totals and plots them is relatively simple, and will be written this summer. The role of microcomputers in English is not limited to text editors, grading programs, and grammar books. A few developments that bear watching.

--Microcomputer dictionaries are becoming inexpensive, very flexible, and fairly good. The Word from Oasis costs $150, and the Random House

Dictionary sells mail-order for $45. Just last month we gave our user group the Random House version, a 35,000 word dictionary and misspellings have practically disappeared. The advent of the disk dictionary is going to occasion a debate like that heard on the introduction of the pocket calculator. The result is as inevitable.

--There is a dimunition of Writer's Workbench out called Grammatik that sells for $70 mail-order. Grammatik checks for doubled words, undoubled parentheses and quotation marks, peculiar combinations of capitals, etc. It has an extensive phrase dictionary that identifies wordy adverbs and prepositions, as well as putatively sexist diction. It can be modified to handle your pet peeves--I've included "utilize" and "prioritize"--and it can be configured for print-out. Like the dictionaries, Grammatik is a large program: both occupy about 125K of disk in their most truncated CP/M forms.

--If your university already licenses some or all of the Version 7 Writer's Workbench, there are new communications programs that allow your microcomputer access to it. Our university has installed a public domain program called KERMIT, which allows packet switched check-sum communications between a variety of micros and DEC 10s and 20s, VAXs and some IBM mainframes. Ask around. You may be able to use some very sophisticated programs on your school's mainframe if you can establish a good access path. One of our current projects is a batch collection of student text files on the VT180, with overnight transmission to a batch program on a VAX. The VAX batch program will run the student texts through STYLE, SPELL, PROSE, and DICTION on Writer's Workbench, and have the results ready for pickup in the morning.

--Pay attention to programming developments for the IBM Personal Computer, currently the hottest hardware on the market. The ease of adding memory and other boards to micros that this machine exemplifies was not previously possible on micros. The Edix and Final Word text editors are good examples of the kind of software that this increased memory will make possible; it handles up to nine scratchpad buffers simultaneously, and can display them in left-right split screen mode. We are currently re-designing WRITER/GRADER/READER for the IBM-PC.

--A related IBM-PC note. The Homer project at U.C.L.A. is using the PC as their model machine, although their software will be written in UCSD p-code and is supposedly transportable to any microcomputer. The goals of the Homer project are a number of "pre-writing" programs and a text editor designed specifically for the tasks of student writing. If the prospect of someone writing a split-screen editor in Pascal intrigues you as much as it does me, you'll be interested in this project.

--As mini-computers like the Colorado State University Onyx become cheaper, they will offer a promising hardware solution to our problems. They have the memory, capacious CPUs, and they can handle a dozen or more terminals at once. This will permit the use of quality terminals, such as the CT-100, with its programmable screen, with sophisticated memory consuming software written in difficult languages.

Grading student essays on computers is hardly a panacea. Some of the drawbacks are obvious: you have to sit at a terminal to do it; you can't

watch NFL football and grade the papers on your lap. Computers are not very portable, whereas papers are. It is very difficult to draw lines and circles to connect things on a computer screen, and incredibly easy to do so on paper. Articulating in a comment on screen the point that you made by drawing arrows to two conflicting ideas on paper can take 40 or 50 times as long. Computer graphics and light pens will never do these things as fast or as well. Nor will Visi-on's mouse. Computer grading tools standardize EVERYTHING about grading, eliminating the option of writing AWK in triple height letters beside an atrocious section of student prose.

It would be foolish to ignore problems at the student end either. The access and security problems with microcomputers are such that writing on them involves working in a noisy, distracting, crowded environment--becoming one of a crowd and generally unreflective. This is contrary to the qualities that most of us try to engender in students and their writing. There are continual problems with file losses and disk damage. What do you say to the freshman who's lost two hours of his homework because the electricians changed a fuse and interrupted the power to his machine? He'd still have his work if he'd used a typewriter. What about those inexplicable glitches in the software that he can never reproduce in front of you, but which you know as well as he exist?

Finally, let us be aware of burdens we may be imposing on our own beleagured departments. Computers of any type require maintenance, and fair amounts of it when you begin to acquire large daisy-wheel printers. The annual maintenance contract on my two micros, one printer and two modems is $1,400 a year. The insurance rider is $250. I've gone through $250 worth of disks this year. If you're giving the students their disks, that's $3 a student. Printers use paper. Eventually you will have to replace components of your system; most service these days is modular, which means that instead of looking for the $2 chip that is malfunctioning, the vendor replaces the entire $900 board. Increasingly, universities are encountering security problems: you can bolt your machines down, indeed your insurance will require that you do so, but what do you do about engineering students who come and deftly remove chips or boards that they want?

There are also scheduling and logistical problems. Assigned times for work must be enforced, usually by a department secretary or lab assistant who is already too harried. Who hires site or lab attendants? Who pays them? Who checks the supplies of paper, disks, printer wheels and ribbons, and orders more? Who fixes and recompiles software when a bug is discovered, and makes sure that the old software is changed in every location? More important, how do you prevent people from stealing your software, or from inserting fatal bugs into operating systems and other utilities? We have already seen deliberate attempts to vandalize our grading program.

Here is a distillation of what we have learned over the last three years.

1) Never, never buy a computer that is new on the market, regardless of the maker. It will have bugs in it for 12 months. It will be at least 20% cheaper in 18 months.

2) Only buy hardware and software from major companies. Major hardware companies are firms such as Apple, Atari, Radio Shack, IBM, DEC, Commodore, Osborne and Xerox. Where is Exxon Office Products today? Two years ago they had four-color spreads in Time. Major software companies are outfits such as Microsoft, Supersoft, Digital Research, Sorcim, Visicorp, etc. If you venture $500 on a lattice C compiler from Kludge Concoctions of Costa Mesa, you have probably thrown away five C-notes.

3) Get as many "generic" features as possible on the hardware and the software that you purchase. Machines that run peculiar operating systems should be ruled out. Machines should have lots of standard parallel and serial ports, not special interfaces that work only with the manufacturer's tape cassette. Software that produces peculiarly formatted files should be avoided, unless, like Wordstar, it is so widely used that other software designers have to make allowances for it. One way to check for this is to "TYPE" a text file to the screen.

4) Let other people de-bug the software for you. The ethics of software publishers are of a league with those of procurers; they put the product on the market as soon as possible, counting on dissatisfied customers to report the flaws for correction. Customers do a lot of work that should properly be done by vendors in the first year a program is on the market.

In spite of my gripes, I think the compensations of entering this age of "electronic writing" are overwhelming. As I know personally, and as students in the fall class demonstrated, writing on micros has tremendous advantages. I suspect, moreover, that it is the future form of writing. Everywhere that I look, I see people at terminals: in newspaper offices, in television studios, at stock brokerages; at law firms, in libraries and accounting firms, at the division of motor vehicles and even at the unemployment office. Increasingly, the information we need is on data-bases or available from OCLC, and the people who publish our work would prefer that it arrive on disk to avoid retyping. Our challenge, as William Carlos Williams said of a poetic revolution that responded to technological change, is "to transfer values into a new context, to make a poem again."

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COMING OF AGE WITH COMPUTERS: ONE DEPARTMENT'S EXPERIENCE

by
Mark E. Rollins

Microcomputers are becoming important components in many programs of literature and language instruction at all levels of education. Some departments, especially those in larger institutions with access to mainframe computers, have a relatively long history of using computers in research and instruction. But before the development of the microcomputer, departments in schools and small colleges have not been able to use computers since they lacked access to affordable equipment. The relatively recent growth in microcomputer technology, however, accompanied by its greatly diminished cost, has put computers within the financial reach of programs in most schools and colleges. Yet while many schools and departments wish to introduce computers into their programs, the task of choosing appropriate hardware and software often falls to individuals who have little knowledge or experience with computers. Moreover, given the considerable amount of money being committed, as well as the fact that the computer system chosen will be around either to bless or haunt you for some time, this initial decision is enormously important. Perhaps, then, an account of one university English department's efforts to specify and acquire a microcomputer system might prove valuable for others who anticipate a similiar task in their own program's future or who are planning to acquire a microcomputer for their personal use.

The Ohio University English Department's efforts to incorporate computers into its programs began rather recently. We are part of a relatively large university with an enrollment of about fifteen thousand students, and this proved to be a mixed blessing regarding computers. Like many universities of its size, Ohio University had made a multi-million dollar investment in computers to support its extensive programs in such areas as the sciences, mathematics and engineering as well as for use in general administrations. But evidently most of us in the humanities construed computers as tools reserved for use exclusively in these areas and hence--illogically--as intrinsically threatening to the humanities. Moreover, due to the large size of our humanities faculty who work independently in separate departments, the work of the few individuals who were in fact using computers for research and instruction remained unknown to their colleagues in different departments. For example, while some of us in English were storing and sorting thousands of three by five index cards, an otherwise familiar colleague in the history department was anonymously keeping a working bibliography consisting of thousands of entries in the University's mainframe computer. Moreover, he had been using the computer for nearly ten years. In short, our failure to investigate uses of the computer in English was not due to indifference or antipathy, but rather to a typical lack of communication between units of larger universities. Had we been a department in a small college, say, where

humanists and scientists maintain closer communication we might have known the value of computers in research and instruction years earlier.

It was not until this writer visited the University of Michigan's College of Humanities in the School of Engineering that I realized the instructional support computers were providing to writing programs. My experience at Michigan urged me to explore the possibility of putting computers to similar use in the English Department at Ohio University. Soon I found myself chair of a committee with a mandate to assess incorporating computers into the instructional programs of the Department as well as using computers to support research and scholarly publications. The process of introducing computers to our programs began by trying to assess and define departmental need, studying University computer resources, determining the effect computers could have on department programs, specifying appropriate hardware and software, and, finally, seeking funding to acquire the goods.

Our committee consists of individuals from the principle sectors of a university English department. One member is a bibliographer, another is the editor of a scholarly journal and yet another is a former director of the undergraduate writing program who is interested in computer programming. The remaining members of the committee voice suspicions and dispense wisdom while the chair writes letters, makes phone calls, schedules workshops and searches desperately for financial support. The composition of the committee is critical since the members represent areas of applications the computer might have in an English department. For instance, when computer specialists were invited to visit the committee to explain certain hardware and software, they would be asked to answer questions concerning potential application of the computer to an individual's work. Some of these question and answer sessions were punctuated with the groans of committee members who realized the help the computer could have provided their research had they known of its capabilities: how, for instance, boxes of documents could be committed to a few floppy disks; and for manuscript preparation how scissors and tape could be retired to gift wrapping rather than act as editorial aids. In the context of teaching, we learned that we need not spend valuable class and office hours discussing subject-verb agreement when the computer could do the job perhaps more effectively and certainly more effortlessly. In short, it became abundantly clear that the computer was not a threat to our work as humanists, but rather a potential boon to our research and teaching.

Once our committee was convinced that computers should be incorporated into the work of the Department, we set to work with the University's Computing and Learning Services division to design a series of tutorial seminars and workshops to introduce faculty to computers. First, we polled faculty to assess the degree of interest in computers within the department and found that fully one half wished to participate. The purpose of these seminars was not to provide "hands on" instruction--this would come later--but to give faculty the opportunity to fathom the basic theory of computers, gain a familiarity with computer jargon (an amusing diversion for students of language), and have occasion to quiz specialists about the computer's abilities and limitations in the context of research and instruction in language and literature. About a week following the seminars we scheduled a series of (literally) hands-on tutorial workshops to instruct faculty in the rudiments of word processing.

In retrospect, these workshops could have been more effective had the computer instructors known more about the needs and experience of English professors, but the workshops did succeed insofar as all participants--many for the first time--had experience with a computer terminal. And while many faculty discovered the computer can be rudely indifferent to one's presence, they also found that it does not bite and if properly addressed will do as it is instructed. The final phase of introducing faculty to computers consisted of obtaining on loan from Computing and Learning Services a microcomputer with a word processing program and extensive documentation. This microcomputer--an Apple II Plus--was stationed in the office of a faculty member on leave where those interested could use it at their convenience. Our strategy was to bring the computer to the faculty where they could use it at ease rather than require them to enter the usually hectic and potentially unnerving environment of the computer centers.[1]

Specifying the appropriate hardware and software proved to be one of our most difficult tasks. First, there are any number of perfectly acceptable hardware systems on the market. Each system offers a feature which ostensibly places it at an advantage over a competing system. Therefore, rather than let one feature dominate our criteria for selecting a microcomputer, we sought to determine the most desirable balance of features. To accomplish this, it is necessary to define our immediate need yet predict as reasonably as possible what our requirements in the future shall be. Any number of questions leap forward to be answered: Will the system satisfy the needs of all users? Can the system be expanded to accomodate future need? Is the system compatible with existing hardware within the institution, or can it be made compatible? And, of course, is the system's cost within the anticipated budget? These are but a few of the more important criteria to be studied. To complicate matters, it is commonly insisted that due to the rapidly developing technology related to microcomputers, a piece of hardware is obsolete by the time it comes on the market. Hence, we must ask ourselves whether we should wait to buy a system, or should we take the plunge and hope that current technology will fill our needs. All these questions must be addressed if not answered.

In such a rapidly developing field as microcomputer technology, we may expect some remarkable developments in hardware and software in the near future. But we should be cautious not to be seduced by the various exotic "bells and whistles" which promise, we are told, to revolutionize the industry. Our committee concluded that our research, writing, and instruction could be managed quite well without seeking or waiting for an ever-changing "state-of-the-art" this or that. We decided that an excellent word processing capability must be an essential feature of the system we specified. But since word processing is a function largely dependent upon the software program, this requirement did not seriously affect our choice of computer hardware. We knew, though, that we would need a system with considerable memory capacity due to the scope and size of much of our work. This factor led us to specify a floppy disk memory system since hard disks were too costly and cassettes relatively unmanageable. One of the greatest problems we encountered concerned following precedents. There was pressure to opt for the Apple II Plus which had been selected for use in the University's computer centers, or we could specify the newer and more efficient 16 bit systems offered by IBM and DEC.[2] Many faculty in other departments advised (cajoled?) us to adopt

the Apple since so many programs for it were on the market, as well as the fact so many Apples were currently in use in the University. But computer specialists urged us to seek the more advanced technology offered by the IBM and DEC systems, and not concern ourselves about the sheer number of programs for the Apple since most of these were irrelevant to our work anyway. Finally, we looked at the matter of compatibility with the University's mainframe which is essentially an IBM system. When we ultimately balanced the most important features necessary to our work, we decided to specify the IBM "PC" system as the most satisfactory to meet our needs. Not only did the "PC" promise to satisfy our requirements within the Department, but it is sufficiently affordable that individual faculty could purchase it for home use as well. This is not to denigrate the Apple system nor any of the many others that could have successfully met our needs. The Apple in use in the Department now is very-well received indeed. Inevitably, each group or individual must assess its own needs and select the most technologically appropriate and yet affordable system.

Selecting the specific computer system was the pen-ultimate phase of the committee's work to bring computers into the Department. The final step--one in fact we are still making--concerns finding financial support to acquire the hardware and software. Most schools or departments--regardless of the institution's size--do not have line items in their budgets for buying expensive computer systems. In our particular case, lacking the enviable wherewithal to sell cookies door-to-door or organize car-washes to get the money for a computer system, we have directed our funding efforts in several alternative directions. First, although the sciences, engineering and mathematics have garnered most of the attention for computer use in the past, the humanities are beginning to justify their credibility as computer users as well. Therefore, we should anticipate that institutions look favorably upon departments in the humanities as targets for funding since these departments are usually infrequent visitors, as it were, to the institution's capital trough. Moreover, larger institutions often have more than one source of internal funding, and those seeking funds for computers would do well to knock on more than one door. Our department, for example, has two internal grant requests currently under review.

Another source of support is the manufacturers of computers themselves. Some manufacturers regularly sponsor grant competitions for individuals affiliated with institutions, and who are engaged in applying computers to research or instruction. Some of the more notable of these grant programs are sponsored by Apple and Tandy/Radio Shack. Individuals who are designing specific research projects should also contact manufacturers for material or financial assistance. IBM, for example, offers two grant programs to encourage research using computers.[3] One program, the "Joint Study," provides the individual with hardware on loan to use in research. This program allows IBM access to the researcher's findings. The other program offered by IBM, the "Grant Program," provides direct financial support to individuals who are applying computers to projects with "intrinsic human value" and which "benefit mankind." The support offered by the manufacturers demonstrates that you need not be a researcher in electrical engineering to get assistance. My point here is simply this: an evident shortage of funds should not discourage individuals or institutions from seeking computers for their work. Between the car-wash and the corporation one should find a source of support.

This paper has attempted to outline very briefly the work of one committee in one department in one university from its initial exposure to computer use in other English departments through its efforts to specify and acquire hardware and software to support its faculty's research and its instructional programs. We approached our assessment of computer use in English through research, discussions with specialists, and demonstrations by individuals already using computers in their work. Some of us began with a vague suspicion of computers, yet we finally concluded that computers--especially in the form of microcomputers--posed not a threat but rather an enormous gift to those working in the humanities. We also anticipate attractive new avenues of research and instructional support which will benefit our students and ourselves in a host of ways: a means to address students' writing difficulties, a vehicle to provide tutorial assistance to students wishing or requiring background or supplementary information in literature courses, as well as providing valuable word processing facilities for students and faculty alike. The computer can never replace the individual instructor in the classroom but it can provide an essential aid to the instructor--especially in this period of enlarged class enrollments. Not all faculty, of course, will use computers in either teaching or research, but henceforth any school or department at any level will be at a distinct disadvantage without them.

NOTES

[1]Digital Equipment Corporation publishes and distributes at no charge a useful little book entitled Guide to Personal Computing. It is a narrative introduction to microcomputers (using DEC's own equipment, of course, as examples). The glossary might be particularly helpful. To obtain a copy, contact Digital Equipment Corporation, Maynard, Massachusetts 01754.

Peter McWilliams is the author of two popular and wittily-written books on microcomputers: The Personal Computer Book and The Word Processing Book, both distributed by Ballantine Books. Either book will provide a lively introduction to hardware and software.

[2]We decided to limit our choice of computer systems to one of those the University's technical staff was authorized to service: Apple, IBM and DEC. "Down time" is a serious factor to anticipate, especially for an institution located in a remote area where it might be days before a device could be repaired and during which time a class or program might be delayed.

[3]For information describing grant programs and competitions, contact: Apple Computer, Inc./20525 Mariani Avenue/Cupertino, California 95014; Radio Shack/Education Division/1400 One Tandy Center/ Fort Worth, Texas 976102-2805; (in Ohio) IBM 140 East Town Street/Columbus, Ohio 43215.

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OVERCOMING COMPUTER ANXIETY WITH WORD PROCESSING

by
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Anyone who has watched an English teacher stand haplessly beside a mimeograph machine, spewing paper in all directions, or a projector, crunching the film inside, must wonder whether we are included in Richard Brautigan's satiric projection of a time when people are "all watched over by machines of loving grace." I know from experience that soft drink machines in any teacher's lounge will not dispense its contents to me with the regularity that it performs its duties for others. But these same teachers who have often avoided machines are now being told that they must become computer literate before their students outdistance them, even while ironically struggling to help these same students master the more familiar literacy of reading and writing. English teachers are being told also that microcomputers are not the domain of the math and science classes and that they should begin learning the language of computers and begin devising ways to use them in language arts instruction.

Teachers, however, are rightfully wary of the language arts materials now available for microcomputers because many are no more than old workbooks redesigned for computers with no more appeal than a purple worksheet. But we cannot afford to wait on the sidelines while others develop the materials for us. We must learn enough to describe, assist, and demand the type of instructional courseware needed for English. To do this, we need to know enough about computers, not to program elaborately but to understand the operation and capabilities of this instructional tool.

But taking classes in computer programming as a way of overcoming computer anxiety makes as much sense as teaching grammar to students as a way of overcoming writing anxiety. Programming is too closely related to mathematics and, in fact, does require more knowledge of math than suits most teachers of English. Word processing, however, is an excellent way for teachers to begin working with the microcomputer because they are dealing with words--old, comfortable friends. It takes little skill to begin the process, and the advanced operations are learned as teachers produce a piece of writing.

In two Writing Projects this past summer, another director and I, both computer junkies, brought our microcomputers to the project with the offer to introduce word processing to any interested participant. Some teachers flocked immediately to the demonstrations and were soon entering text like pros. Others held back--the anxiety was visible. They skirted the stations,

intently eying the machines and texts appearing on the screens, looking enviously at the printouts being waved jubilantly, and watching others easily revise text and quickly get a fresh legible copy. They began to straggle up, asking if someone would help them learn and soon joined the ranks of word processors.

In developing our instructional plan, we decided to reverse the procedure described in most manuals. We had learned from our own experience that reading manuals was a formidable, frustrating task until we had become comfortable with the operation of both the computer and at least one word processing program. We also knew first hand the anxiety of "initializing" and "booting" disks.. We decided to skip these processes and go directly to entering text onto the screen.

We saved to a disk a paragraph that needed some editing. Beside each computer we placed cards listing simple editing commands. As we booted the word processing program and brought the paragraph to the screen, groups of three at each computer watched while we talked through what we were doing; but they understood that they would learn this process later. We then demonstrated the selected editing commands. As one teacher practiced editing, the others watched the process. Every few minutes the operator switched. Within a half hour they were ready to put their own texts onto the screen. At that point we taught them "saving to the disk." We operated the printer, however, leaving that instruction for a later time. Once they had printouts of their work and began revising, we taught the more advanced editing features as needed--moving blocks of texts, search and find techniques, and formatting. By adding this information to their cards, they developed a practical, usable manual.

As teachers gained confidence, we invited them to "boot" the program for the others at the beginning of the work sessions. The processes of initializing disks and operating the printer were saved until last when their enthusiasm was high and they wanted to become independent operators.

As they used the word processor, they began to see the possibilities for classroom instruction. They knew they were revising more; in fact, revising was fun. With their poems, they experimented with line arrangement, striving to merge content and form. They talked of class publications and how much easier they could be produced. They liked how justified columns would give class newspapers a professional look, even ones produced by elementary students. Because the computer is silent, they saw how it could be used in the classroom without interrupting others. They decided that most printing of text could be done after school. In that way the printer would not tie up the computer use, and the noise also would not be a disturbing factor.

From their own experiences with writing using the word processor, they could see the potential for motivating their students to write and to revise. I know that my own middle school son, who likes words better than numbers, finds much more satisfaction in and exhibits more confidence with word processing than with programming in BASIC. He likes writing when he knows the product can be put in the computer; he more readily sees his errors on both

the screen and the printout (unlike his own messy handwriting); he revises willingly because he won't have to recopy the paper. His English teacher recently commented that he even "turns his papers in with a flourish when they are done on the word processor," There is a professional, unschool-like look to the products.

Only one teacher did not at least become familiar with word processing on the microcomputer. The anxiety was apparently too much to overcome. Furthermore, those who waited the longest time had the most difficulty in taking that first step because they were joining a group that already had some finely developed skills. This situation, I believe, is similar to other skill activities. When your friends, for instance, have learned to ski and have left the bunny slopes, it's much more difficult to join them with the clumsy skills of a beginner. The longer you wait, the more likely it is that you will never participate. This certainly appeared to be true with these two groups of project English teachers, which makes an even stronger case for teachers' learning about computers now before their students' level of computer literacy becomes another inhibiting factor.

I think there are two conditions under which English teachers are likely to accept microcomputers. The first is to make the learning experience as nonthreatening as possible; therefore, word processing is a logical entry point. The second is to see the possibilities for creative classroom use, making the microcomputer a "machine of loving grace."

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NOTES TO WOULD-BE WORD PROCESSORS

by
RICHARD GEBHARDT

This is a sort of a letter or journal--take your pick--recounting the experiences, discoveries, and thinking processes of an English teacher who decided it was time to buy a microcomputer and start working with word processing in his writing projects and teaching. These Notes are "true," in that they reflect what I did and what I learned as I shopped for, set up, and began to explore a word processing system. I do not claim, of course, that technical details in these Notes are as accurate as they would be in a Consumer's Reports article, only that they reflect the understanding of an English teacher and would-be word processor.

Deciding to Do It

About six months ago, I started to get serious about buying a word processor. I do a lot of writing--class materials, memos, articles for publication--I told myself. And it only makes sense to utilize the electronic resources of a microcomputer, instead of limiting myself to the mechanical resources of a typewriter. It also makes sense, I argued, to learn to use the communications tool of the future and to get ready to bring this tool in my writing instruction. I had been intrigued with what the computer could do for the writing teacher since I'd seen Ellen Nold's "Fear and Trembling: The Humanist Approaches the Computer" (College Composition and Communication, Oct. 1975), and in the past couple of years I had read things, like William Wresch's "Computers in English Class: Finally Beyond Grammar and Spelling Drills" (College English, Sept. 1982) and Joseph Lawlor's collection, Computers in Composition Instruction (SWRL Educational Research and Development, 1982). I figured that the only way that I could evaluate the claims of these articles, would be to develop my own familiarity and confidence with a computer. And I knew that the only way I would find the time to do that would be to have my own microcomputer sitting near the desk in my office at home.

Still, I held back. I didn't have the money, I said. Such advances are going on in the microcomputer field, I told myself, that it would be a good idea to wait a while, until prices come down and I can get a more advanced system. And then one morning, listening to the Today show ("live this week from California's Silicon Valley," Jane Pauley said in her opening)

while I got dressed, I developed a new perspective. Jane was interviewing a person who ran a "computer phobia" clinic for people who need computers but constantly convince themselves that they had better wait until prices come down or microcomputers improve, or something. The expert made a point that spoke directly to me (even though I don't think I had computer phobia): microcomputers are going to become more sophisticated and prices are going to fall, so people who wait until computers improve and prices bottom out will be waiting for years, without a computer. The only thing to do, said the expert, is to go on and do it--get a computer and start developing your ability to use it, so that you will be ready to move on to better equipment later. That all made sense. And I started to get very serious about buying a word processor.

A "word processor," you just said? Not a "computer"?

Well yes, what I bought was a microcomputer. But what I bought it for was word processing--not playing electronic games or composing music (though the computer will do both of those things), not balancing my check book (though I can use all the help I can get with that job), not tracking the mutual funds in my IRAs (though maybe I will get around to doing that with the computer someday). No, I was interested in using a computer to draft articles and memos, to modify drafts, to store alternate drafts (or alternate versions of sections of drafts), to let me change and reshuffle parts of drafts at will, and to send the signals that would make a printer spew out perfect copy at the rate of a minute or less a page.

That's word processing. Or at least that's what I thought it was last summer and still do. What that is not is computing. To be more specific, such manipulation of words is not all that computing is. A microcomputer is a fairly neutral machine that can be a word processor or a bookkeeping aid or a game machine or an inventory-control system, depending on the software package. And that is why, as I discovered at the very start of my quest for a word processor, you can't just shop for a computer. You've got to buy "hardware" and "software."

A Ghastly Glossary

Hardware is machinery--the computer, keyboard, video monitor, disk drive, printer, and the assorted connections betweeen them. Software is invisible, electronic stuff, stored on floppy disks, that makes the hardware work like a word processor and not an "Attack of the Cretins" game.

A disk is really a 5¼ inch square with mysterious stuff inside it. A disk that comes with a fat manual about how to work the computer after you load the program into the computer is a software package. A disk that is so blank that you have to new it before the computer even knows it is there is just a disk, and it can hold up to about 80 double-spaced pages of text.

A disk drive is a piece of hardware that costs at least as much as an

inexpensive computer. It does things electronically with disks so that the stuff in a software package gets rammed into the computer, so that the stuff you are working on with the computer has a place to go for storage when it is memorized, and so that you can recall stored stuff into the computer later.

A keyboard looks like a typewriter keyboard, but it uses electricity to activate characters on the video monitor and simultaneously in the memory of the computer, and it has magic control keys that change a simple key like "D" into a powerful order like, "Delete Everything." It also has cursor control keys that govern the movement of the cursor--a mobile bright spot on the screen that marks the place where the next key stroke will put a character on the screen, and simultaneously in the memory.

A printer is something like a typewriter that prints on paper the words and other symbols you have created with the computer.

A word processor is a software package that can turn a microcomputer into a word processor, a computer that is working as a word processor, and the person sitting at the keyboard of a word processor.

If, by some chance, you perceive slight glossaric deficiencies in those last six paragraphs, you might like to read some things like these:

"Special Report: Choosing the Best Computer for You," Money, Nov. 1982.

"Special Report: Word Processing--Finding the Right Software," Personal Computing, April 1983.

"Hardware for Word Processing" and "Software for the System," chapters one and two in Andrew Fluegelman and Jeremy Hewes' Writing in the Computer Age (Anchor Books, 1983).

It's Hard to Buy Software

The conventional wisdom about how to buy microcomputers and software is to start with the software you need. As Augustin Hedberg puts it in "Choosing the Best Computer for You," "software dictates hardware. Find the software you want. . . Then, and only then, find the machine to run the software" (p. 72).

That makes sense. The nonsense only starts when a would-be processor tries to follow that advice. How do you decide what features you need in software before you know what a word processor can do? How can you explore the potential of word processing without having some software? The answer to both questions, of course, is that you can't. To escape this Catch-22, would-be word processors turn to friends who have word processing software in their microcomputers, to magazines like Creative Computing and Personal

Computing, and to stores where sales people are always happy to demonstrate the software and hardware they sell.

Those last six words, though, imply another reason it is hard to buy software. Your friend George may recommend the "TI Writer" software he is using in his Texas Instruments TI-99, while Sarah touts the "Super Scripsit" she uses in her Radio Shack TRS-80 and a sales person gives an impressive demonstration of "Apple Writer" in an Apple IIe. If you think that any of the three combinations of hardware and software would meet your needs, your choice is easy, since you can stop worrying about computers and think about things like price and dealer-reputation. But if you think that "Super Scripsit" is the best software but that the Apple is the machine you want in your study, then you run up against that fact that the software you want may not be available for the hardware you like.

Shopping on a Shoestring

Two snags, then, complicate the shopping plans of the would-be word processor: the need to look for sofware and hardware at the same time, and the fact that specific software packages do not always fit specific computers. Both of those snags are further complicated by the large number of options you confront and by the wide range of prices for both software and hardware. Interestingly, though, this financial factor actually can simplify the job of buying word processing hardware and software.

When I began computer shopping, for instance, I knew roughly how much I could spend on my system--a couple of thousand dollars for computer, disk drive, word processing software, and printer. Given that limitation, I did not have to worry much about the $500 "Wordstar" package, any more than I had to spend a lot of time evaluating the IBM Personal Computer (over $3000 without a printer). I did not have to sort through the whole universe of software and hardware. I shopped, instead, in a smaller world, where a few decisions, a few hunches, and some luck led me to the hardware and software I ultimately purchased.

Certainly, it was luck that exerted itself one October afternoon, when the November 1982 issue of Money arrived at my house with a 40 page special report on how to choose computers. The report, written for computer non-users, defined many items of computerese and gave general information about the way computers work in word processing and other areas. The report also described features to look for while shopping for computers, software, and printers, and it contained a buyer's guide describing three dozen "of the best or most interesting machines on the market" (102).

That buyer's guide classified computers into several different catagories, and as I began to think in terms of those classifications, I could feel myself moving toward some decisions. The "recreational" computers (like the Timex Sinclair 1000 at $99 and the Texas Instruments TI-99 at $299) just did not feel right to me, especially when I compared them to the

"professional" and "general purpose" computers. My ego, of course, drew me toward the professional machines (such as the DEC Rainbow at $3495 and Wang PC at $3395). But my self-imposed price limit brought me back to reality, and I found myself looking most seriously at the general purpose computers: the IBM PC for $3795, the Franklin ACE 1000 at $2653, the Apple II+ for $2520, the Radio Schack TRS-80 Model III at $2295, the Atari 800 for $2099, and the Commodore 64 at $1393.

"$1393?" I said to myself. Does the Commodore 64 really cost about half as much as an Apple or three-fifths as much as the TRS-80? Reading more closely, I found I was just about right. Money indicated that the Commodore 64 with two disk drives but no video monitor did, indeed, compare very favorably with the prices of the other computers. (Adding a monitor, I found later, could cost as little as $90 more, though for a while at least I could try to make do with the portable television in the basement.) With any of the five general purpose computers, I would need to get a printer if I wanted to do word processing. How much that piece of hardware might cost I did not know. But I did know that only the Commodore 64 would let me even think about adding a printer without going through my price-ceiling. In fact, I felt myself being pushed toward an inevitable conclusion about the computer I would buy.

"What's the catch?" my dubious-consumer personality asked. I worried that a computer so much less expensive than those other machines would be "cheap" in ways other than financial. Well, by re-reading the lead article in Money's special report, I found some reassuring words about the Commodore 64: "it seems to be able to do almost anything its pricier friends can do" (p. 72). When I checked that sentiment with two high school computer addicts, a sales representative for Commodore and two other companies, and a technician who works with several brands of computers, I did not hear enough negative comments to make me want to delay plans or to raise my price ceiling by $1000 or so.

So there I was, decided on a computer because of price and, I hoped, quality, but still facing the software decision. I'd violated the buy-hardware-for-your-software rule. Because I had, my software options were limited, and so my decision ended up being fairly simple.

When I skimmed the "Word Processing Buyer's Guide" to 57 software companies in the April 1983 issue of Personal Computing, I could find only seven software packages available for the Commodore 64. I easily eliminated the "Wordcraft Ultra" because, at $545, it would cost $150 more than the price tag on the computer I was planning to buy. When I told sales people that I wanted a word processor to write memos and articles, some fairly long and using footnotes, I learned things that caused me to eliminate most of the remaining software. In a couple of these conversations, people spoke favorably of Professional Software's "WordPro 3 Plus/64." At $90, it fit into my price range. A showroom demonstration and a glance through its inch-thick user's manual suggested that the software would do pretty much what I wanted a word processor to do. And an overwhelmingly-detailed comparative chart on word processing software in Personal Computing's buyer's-

guide article gave me even more reason to feel comfortable buying the software package. Of 79 specific ways that word processors can deal with language on the video screen and with a printer, the chart said that "WordPro 3 Plus" had 64 features--2 more than Radio Shack's "SuperScripsit" ($199), 3 more than "Apple Writer II" ($195), 6 more than IBM's "Easy Writer 1.1" ($175), and 7 more than Texas Instruments "TI Writer" ($100). (As a point of comparison, MicroPro's $495 "Wordstar" package for Apple and IBM had 72 of the 79 features mentioned in the chart.)

And so I had found my way to software that fit my computer and would let me get started at word processing. Perhaps, I'd not made exactly the right choices. Perhaps I'd made good choices for the wrong reasons. But at any rate, I felt good about the start of my word processing system: computer, disk drive, software (disk, with detailed manual)--all for $932.34, including tax.

Turning On

Turning the new computer on was simpler than I'd dared to hope. The directions in the 160 page Commodore 64 User's Guide were clear. Cables fastened as they were supposed to fasten--between computer and disk drive, between computer and the VHF antenna terminal on the television set I decided to use as a monitor. The only snag in the set-up routine was that I forgot to switch the television tuner to the right channel and had a strange static pattern when I turned the computer on. When I finally mastered my television set, I found the computer blinking a greeting--"READY."

"Ready" means, more or less, "I'm ready to do some work, you human; would you please get on with it?" So I played with the keys, saw capital letters appear on the screen, wondered at the odd assortment of symbols (horizontal and vertical lines, marks from playing cards, the British pound mark, the mathematical symbol for pi, and the like) sharing keys with the good old A-Z, 0-9, and other typewriter keyboard features. There appeared to be a lot in the owner's manual about how to use such symbols, but I put all that aside and turned to the large looseleaf binder containing the software.

I took the flexible disk out of a plastic pouch inside the front cover (hoping I would not bend or otherwise ruin the $90 piece of plastic), and inserted it into the disk drive, following directions in the VIC-1541 Single Drive Floppy Disk User's Manual. Then I turned to the first page of the WordPro 3 Plus User's Manual and started looking for what to do next. The directions were clear, and they clearly were aimed at readers as ignorant as I was. For instance:

Lesson 1: Turning on the Equipment

Lesson 3: Loading WordPro 3 Plus/64 [from disk to computer]

Lesson 5: Exploring the Keyboard.

Lesson 3 told me to type LOAD "*",8" and hit the return key. I did, and a minute or so later, the computer had changed into a word processor.

After the metamorphosis the limited options on the screen expanded greatly. The system could make use of upper and lower case letters; eliminate mistakes with the touch of a back-spacing "Delete" key or a more powerful command to delete words, lines, or sections; insert words, phrases, or sections into the middle of text; rearrange sections. And it did all this--or rather helped me do all this--with so much flexibility and ease!

Consider that last sentence. Pretend I have just typed it on the video monitor like this

But it did all this with so much flexibility, ease, and adroitness!

and that I want to make changes. With typed copy, I would need to cross out and correct and retype. With the word processor, as I figured out in a bit less than two hours, I only had to:

1. Use the cursor control keys to move the cursor over the first letter and then type And. With each keystroke, one letter of the previous word disappeared and was replaced by a new letter.

2. Move the cursor to the space just after this, hold down the shift key, and touch the control key to put the computer into "Insert" mode. After this, I was able to type--or rather helped me do all this-- as I watched the original sentence open to make room for my new idea.

3. Move the cursor a few more spaces to insert and between the words flexibility and ease, and then cancel the Insert mode by holding shift and touching the control key.

4. Move the cursor to the start of the second and. Touch control and then D, in order to enter the "Delete" move; touch W for "Word" once (at which point and was highlighted) and a second time (to highlight adroitness); and then touch the return key to see and adroitness disappear.

5. Read through the revised sentence, spot the stray comma after flexibility, and eliminate it by covering it with the cursor and hitting the space bar once.

That account of how you might change a sentence with a word processor probably does not give you a very clear idea of the process. It is hard to imagine letters, which we tend to think of as solid ink on paper, vanishing so easily, and it is even harder to imagine spaces opening and closing in lines of text to accommodate insertions and deletions. But a word processor does those things and a great deal more. With a word processor:

-You can work with several different versions of a draft, store the versions on a disk, and recall them later for review and modification.
-You can shift around small or large sections of a draft with just a few key strokes.
-You can leave undisturbed a draft you are woking on while you doodle at a related issue in the "Extra-Text" section of the computer's memory, and later you can transplant your new idea right into the middle of the draft with no retyping.
-You can correct every instance of a mispelled name in a long draft with one "Search and Replace" procedure.

I discovered those items of word processing magic, during several hours of reading the software manual and following its directions while I explored the keyboard of my computer. But fairly quickly I also discovered that, as amazing as a computer with disk drive and word processing software is at manipulating and "remembering" words, a word processing system needs a printer if it is going to communicate those words to others.

That discovery was a little unsettling, since I had planned to break into word processing before I broke down and bought a printer. But I found that while I could practice--while I could draft, revise by inserting and deleting, memorize alternate versions, recall various versions for revision, combine parts of drafts in different ways--the whole exercise felt artificial without the ability to create printed copy. A word processor, after all, is a communications tool; and private practice sessions seemed, somehow, arbitrary and ineffective. Then too, I found that many of the computer commands that would turn my word processing into intellegible articles (marginization, indenting, underscoring of titles, indication of footnotes, and the like) would only happen when the computer issued various "Print" commands to the printer I didn't have yet.

Daisies and Dots

And so I found myself, sooner than I wanted to be, back in the world of computer shopping. Naive enough at first to think that I could just go out and buy a printer, I discovered that I had some more decisions to make about cost and quality.

The best finished copy ("letter quality," is the jargon) comes from "daisy wheel" printers that operate something like a bouncing-ball typewriter. They tend to be both slow (12-55 characters per second) and expensive ($700-$3000), the price increasing with the speed. By contrast, "dot-matrix" printers are faster--100 character-per-second rates are not uncommon--and less expensive--$300 can buy a high-quality machine. But their finished copy is not as good as that from a letter quality printer. The difference is that, where a daisy wheel makes a solid impression, the printing head of a dot-matrix printer makes an impression by arranging a number of small points into the shape of a character (sort of the way a few points of light

can make different numbers on a basketball scoreboard) and then striking the ribbon to leave a pattern of dots on the paper. The more space between the wires in the printing head, the less dense finished characters will be and the more fuzzy finished copy will look. Dot-matrix printers also have trouble with "descenders" (bottoms of y's and such that hang below lower-case letters), and this adds to the odd appearance of some dot-matrix copy.

As I discovered these things about printers, I realized that my selection of a printer just might turn out to be harder than the choice of a computer. I write too many letters, articles for submission and other "important" things to have fuzzy, funny-looking copy coming out of my printer. But price was a factor, too. The Qume Sprint II, a fast daisy wheel printer looked good in its ads and in a review in Personal Computing; but its $1776 price tag far exceeded what I had left in my budget for a word processing system. And so I found myself comparing slow letter-quality machines (such as Smith-Corona's TP-I at $985) and a number of dot matrix printers.

At first, I leaned toward the daisy wheel and its promise of great-looking final copy. Then I imagined the tedium of drafting and redrafting at 12 characters a second, feeding sheets of paper into the machine by hand and waiting a couple of minutes to feed the next sheet. Much of the reason for having a word processor in the first place, I thought, is to avoid such tedium and to encourage re-drafting. A printer so slow that I would always be asking myself whether I really wanted to do another draft would defeat some of my reasons for wanting a word processor.

So I looked more closely at the dot matrix printers, and what I found delighted me. The high-quality machines, as opposed to $400 economy models made a pretty credible effort to solve the descenders problem, and they could be set to strike each character twice in order to "enhance" the density of characters and the appearance of final copy. I could begin to sense the sort of decision I would make about a printer.

The Epson MX-80 (80 characters per second, $745) looked interesting. But it had no typewriter-like platen to handle single sheets, and I knew that I would be writing a lot of letters, reports, and articles that I would not want printed on continuous-feed computer paper. The NEC 8023 (100 characters a second, $795) had single-sheet as well as continuous-feed capability and looked very interesting. But it was hard to find a near-by store that carried the machine, and I was not too interested in mail-order. While I was calling and visiting stores looking for the machine, though, I stumbled onto a new model of Epson. The FX-80 had a typewriter platen as well as the traction-feed for computer paper, a denser pattern of dots than the MX-80 or the NEC 8023, and a printing speed of 160 characters per second (80 with enhancement turned on to get pseudo-letter-quality results).

My decision now turned to what, for me, is one of the most troubling things about shopping for any high-tech equipment: purchase price versus service. To buy retail or mail-order, that is the question. To order by mail and, perhaps, suffer the slings and arrows of outrageous service? But

I was lucky enough to find, forty minutes from my home, a store that sold and serviced Epson printers and Commodore computers, and that quoted me a price on the FX-80 that was only $36 higher than several mail-order companies--$685.

Not The End

As the deadline for this issue of Focus draws near, I am waiting for the computer store to let me know that the cables and other connectors to join a Commodore 64 to an Epson FX-80 have come in, and that I should bring my machine in for a fitting.

When I do, I'll have a bill for $798.43, and that will bring the cost of my word processing system up to $1730.77. Maybe for the Christmas season, I'll add a "green screen" monitor, which I'm told will cut down on the eyestrain I may suffer if I try to do too much work in front of the slightly-squiggly images on a regular television screen. If I plan on $150 for a monitor, throw in the $38 I spent for a box of ten floppy disks, add $30 for a 3500-sheet carton of continuous-feed paper, and pay sales tax on all that, I'll still be $40.67 under the $2000 limit I set for myself half a year ago.

I'm sure that I'll add other extras to my system, and a few years from now I may want to move on to some of that more advanced and less expensive equipment I used to wait for. But it feels good to know that I've made a start at word processing, and that I can get on with the job of figuring out how to use my system to help with my writing and my teaching.

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COMPUTERS IN ENGLISH: WHAT IS THE OBJECT?

by
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English is the study of an art form, namely literature, especially British and American, and the development of the capacity to create it. In college the emphasis has been on analyzing, evaluating and writing poetry, fiction and drama, though we also have the responsibility to develop the capacity to create discursive prose, the form of prose most commonly used. In elementary schools, and to some extent in secondary schools, the term language arts has come into prominence; it reflects the greater emphasis there, even if much time is devoted to reading metaphorical literature, on manipulating and producing language structures, especially the discursive ones and those of smaller dimensions.

With either emphasis, the subject of the study remains an art form, its elements, its forms, and its purposes. Even discursive prose depends upon creativity and reflects the stamp of an individual's style. Moreover, we still, in English as in the other art forms, value the distinctive style, as long as its idiosyncrasies do not inhibit the accomplishment of the text's function.

Now it is the nature of an art form that it uses a medium and that the medium is taken to be a tool, a means to the effecting of an end beyond the mere manipulation of the medium. Merely squeezing clay, chiseling marble, moving the torso, mouthing sounds or marking a tablet is no accomplishment. Tools are tools, though we may play games with them so as to learn how to use them more deftly.

The computer, though it is not a medium, is a tool also. The lever multiplied the capacity of human muscle to lift or move. The engine did more. The computer was welcomed because it could improve on the human capacity to calculate in the broadest sense: it could store and consider information in larger quantities, at greater speeds and with more accuracy than one human brain could do. But as with all the great tools--fire, words, money, for instance--computers have an unnerving capacity to seduce and dominate their users and ultimately to distort the process for which they were intended.

The response of many of us English teachers to computers, then, seems to be a combination of fascination with the new

tool—anyone would be a fool to ignore the value of the lever—and reluctance that it will distort the functions to which it is applied, that it will destroy what is valuable in the art of literature or eventually distort if not dominate our relationship to language. Ideally we should be able to make use of the new tool but retain control of it, make it serve the functions we choose to pursue not the functions it chooses for us.

If these generalizations have validity, then what is our course? It should be to make use of the powerful tool that has been presented us but at the same time to be particularly alert to the uses to which we put it, so that it enhances rather than distorts what we are about.

Let us take some illustrations. What more precisely is the computer good for? It is certainly good for doing what has to be done repetitively and consistently. If, for instance, it is wise to have students learn and be tested on spelling lists, then a computer can do this as well as the teacher. Specifically, a computer can be loaded with several hundred spelling words according to level of difficulty and class of problem (i before e except after c, possessives and plurals, changes with certain suffixes, voiced versus voiceless, etc.) and can present a student with a spelling test either by using a mechanical voice or by written means (sentences with a blank to be typed in, or with several alternatives to choose from). The computer can calculate number of right answers, keep for each student a record of that number classified by date, type of problem and level of difficulty, formulate new lists from the original grand pool that reflect the student's present knowledge and individual difficulties, and test him on those.

This kind of operation is appropriate for a computer because it requires pretty unsophisticated calculations, depends upon answers that are either right or wrong (in a sense are binary), and uses the computer's flawless memory capacity; the computer does what is essentially tedious and still tailors the operation to the individual. The individual will have to learn to use a keyboard, but keyboards are considerably easier to learn than penmanship; their drawback is cost not difficulty.

The teacher will not be replaced; the tedious process of making up and grading spelling lists will be. That is change, but it should not be threat. It means extra time, time to make the classroom a place of explanation, experimentation and investigation and a chance for both student and teacher to escape the oppression of classroom drill and the threat of embarrassment. The only professional judgments required by such spelling list procedures are the original classification of words as to difficulty and class of problem and the presentation of a test list appropriate to the individual student's current success and ability. The first remains in the teacher's hands or in the hands of the software writer whose work, like a textbook, might be

purchased at the teacher's direction, and the second is done (objectively and impersonally) in accordance with criteria established by the teacher.

Another time consuming task that teachers need to do objectively and accurately is calculating grades for a grading period. Computers can do this sort of thing swiftly and with no more effort on the part of the teacher than it takes to enter individual scores and to tell the computer, one time only for the entire class, how each score is to be weighted in the final grade.

Computers can make writing up a new version of an old exercise a matter simply of typing in the material that is different. The teacher calls up out of the computer's memory the old version, types in different words or sentences to replace the ones used previously, and gets a copy of the old form but with the new inserts. Once again, the computer does the repetitive work, the mechanical copying and printing, and the teacher creates and provides what takes professional judgment. This is, of course, but one example of the endless number of writing tasks the word processor function of computers can make more efficient.

Another task the computer could alleviate is the mechanical problem of getting prose in front of the whole class and being able to demonstrate the effects of different versions of a word, phrase, sentence or passage. A classroom with keyboards at the students' positions, as in a language lab, could allow students to enter their suggested additions or rewordings on the screens visible to the rest of the class as fast as the student could type. This certainly would be an improvement on the speed and grace with which I write on the blackboard.

One more example shows greater sophistication. Bill Marling at Case Western Reserve has developed an application of computers to the annotating of essays written by students. The purpose of the application is to relieve the instructor of the repetitive and mechanical task of marking and explaining what has been marked, annotated and explained by that instructor over and over again one class after another—items like agreement errors, fragments, comma splices, that are amenable to uniform and relatively simple rules. The program takes the essay typed into the computer by the student—or onto a disk that the computer reads—and wherever the instructor identifies an error marks it. Moreover, should the student getting the marked essay back not understand the reason for the error mark, an explanation is provided upon request. The mechanical process of seeking an explanation in a handbook is bypassed. Moreover, the individual instructor could compose the explanation the computer will provide the student. Of course, the same explanation of a mark will be used every time, not one tailored to the peculiarities, whatever they may be, of the single instance that occasioned the teacher's remark. It may sound lazy, but it may also get the information to the student when and where it is needed.

All of the preceding examples avoid, I think, the displacement of human judgment by a machine. The actions the computers perform are really mechanical, repetitive, tedious and wasteful of human resources. But they are all actions which we believe need to be done, including the labeling, but not the perception, of mechanical errors in discursive prose.

Computers have also been put to work on some other tasks in the study of literature, tasks which are more scholarly and less pedagogical in nature and therefore of less immediate interest to the common reader of FOCUS, but tasks which like the ones we have been looking at have a great deal of repetitiveness about them. Two of these are concordance generation and stylistic analysis of the statistical sort. The first is clearly a matter for a machine when one is available. The second is also, at least in the data gathering stages. The human analyst chooses categories for the computer to find and count; the computer does the mechanical work of finding and counting. And the human analyst once again does the interpreting. Moreover, if we could apply to student essays this ability of the computer to do stylistic analyses, we might reap considerable pedagogical benefits. But more of that later.

We come now to some computer applications of rather recent development that raise more concern about the encroachment of machines upon the subjective processes we associate with art. In these cases the risk increases that we are going to reform our operations not by choice but because of the seductive efficiencies of the tool, that we are going to become the object manipulated by the tool and not the operator of the tool upon an object. The reason for this is that all of these applications, in an attempt to get beyond the merely mechanical, attempt to use the computer to guide the thinking of students. They are programs that work at the invention stage of writing.

One is the work of Hugh Burns of the Air Force Academy. Essentially, Prof. Burns gets the computer to pose a series of questions to the student about the student's topic. Many of the questions are simply means of coaxing more words and thought out of the student (something like "Excellent. Tell me more, Susan."), but the significant ones are based on Aristotle's topics, in particular such topics as definition, cause and effect, comparison and contrast. The computer provides a certain schedule of interrogative stimuli and the student provides verbal responses which, since he typed them into the machine, he can get a printed record of to review and use as material for his eventual essay. Is the computer doing more than the merely mechanical and repetitive? I think it is. But then, is it doing other than the teacher might do for each student if the teacher had the time? Quite possibly. The teacher would probably use professional and personal experience to recognize or select responses from the student that were worth exploring in more detail. The computer is not up to that. But the choice of Aristotle's topics to provide a

set of stimuli for the student is no more manipulative than a set of exercise questions in a rhetoric text would ordinarily be. In other words, a teacher who did not believe in that set of stimuli for students would not choose to use Prof. Burns' program. (The question of whether the stimuli are effective or not, whether students ultimately produce essays with richer content more quickly, is a different matter.)

Prof. Helen Schwartz from Oakland University in Michigan has developed a different set of questions to be presented by the computer to the student in the process of invention. In this case, the students are preparing to write about a character in a piece of fiction. Prof. Schwartz's computer asks the student to type an assertion concerning the character. It then calls for the student to type in evidence from the story to substantiate the generalization the student has asserted concerning the character. Specifically, the student is asked to state what the character does, what the character says, how other characters react to the character in question and what the narrator, if not a character in the story, says about the subject character that would substantiate the assertion.

With this program there is little doubt that the machine is training the student's judgment. This sounds more than mechanical. The program, if used repeatedly, should habituate the student to relating assertions to specific evidence. This is clearly manipulative not merely mechanical. On the other hand, it seems an inspired yoking of the mechanical to the subjective. The student creates and states an assertion of the student's own making, as creative, conventional or cracked as that may be. The evidence the student uses is also a matter of his or her choosing. The forms of thought relations (assertions and relevant evidence) the computer encourages are hardly objectionable. At a later stage in Prof. Schwartz' program, other students are allowed to comment on the assertions and the suitability of the evidence offered, thus creating a written conference through the computer's ability to make a record and to print from that record. Similar procedures can, of course, and presumably do go on in class with more guidance from the teacher and more immediate response from other students. But here is a case in which the students can be stimulated to do more thinking outside class without using the teacher's time to do the same thing over and over again, namely ask students to articulate opinions about a character and keep their mind on evidence for those opinions. The quality of the assertions and the appropriateness of the evidence is unaffected by the machine, just as should be. That kind of judgment is left, quite properly, to the human teacher and to the student's peers.

The seduction of the tool becomes more evident with the program of Prof. William Wresch (University of Wisconsin Center—Marinette) which he calls Essaywriter. Once again the aim is to aid in pre-writing. In this case, however, the questions

asked by the machine are directed toward shaping organization as well as promoting invention. The first part of the program, the part on invention, asks the student to name a topic for a proposed essay. It then asks the student to narrow the topic, no matter how narrow or broad it already is, by listing ten subjects within the topic and picking one of them for the new topic. Prof. Wresch explains, and I would agree, that most students start out with topics that are too broad for the assignment. But the computer's nature is forcing the instructor, at this point, to assume the individual student is like the class of students. Narrowing a topic is a place for training judgement, not imposing class rules or inflexible procedures.

The organization portion of Essaywriter asks the student to write six sentences about either the history, the appearance, the causes or the job/function of whatever he has chosen for his topic. The student picks from among these six assertions three that he likes best, and each of those three becomes the topic sentence of a paragraph, for which the writer is asked to provide up to six supportive sentences. Eventually the computer takes all these sentences and prints them, a maximum of eighteen, in three paragraphs with the topic sentence first in each. (An introductory paragraph based on a procedure I have left out is also printed.) What do we have? The most mechanically organized structure we can imagine and every essay, no matter which student was the author, in exactly the same structure. It is remarkable, but also depressing, to think that a machine can arrange the organization of a piece of writing we implicitly approve of. And actually, of course, it is not a machine but the designer of the program that arranges that organization. Why? Because, I would guess, the economics of letting a student learn from a machine that can do the same thing over and over again without ever losing patience or demanding a pay raise is seductive.

The essay printed by Essaywriter is, of course, in no one's mind anything more than a draft. The student is expected to rework and reshape it. What has been taught is merely the rudiments of structure and Prof. Wresch is as interested as anyone in making the program more flexible and more sophisticated. What we have is an experiment. But the point needs to be stressed: we must keep alert to the dangers of letting ourselves lose the human in humanities, the art in the language arts, whatever disclaimers we make.

The final case I want to take up is a complex, multiple set of programs called The Writer's Workbench. The purpose of this program is to take a text, a student essay for example, and subject it to a number of tests that will alert the operator of the program, presumably the writer of the text also, to organizational, grammatical and stylistic problems. For instance, one part of the program prints the text with all "to be" verbs in it capitalized so the writer may change them into worthier verbs. That seems reasonable to me since it presents facts--the

existence and location of words--so the writer may consider making changes. The only preempting of judgment is in the identification of the class--"to be" verbs--that is counted. The part of the program that checks spelling is even less objectionable. Spelling is one of our most uniform conventions. There seems every reason to let a machine do the mechanical task of physically going to the dictionary and the program only identifies words which may be misspelled; it does not automatically correct misspellings.

The Writer's Workbench gets considerably more judgmental with its test for abstractions. This segment uses a list of 314 abstract words of more common usage, and figures out the percentage of these abstract words in the text. If the number is above 2.3% the program will alert the operator. I am not sure why that percentage is chosen; it could be that that is an average number of abstract words in essays normally produced for a freshman writing class. In any case 2.3% is it. You're ok or you're not. Another segment of the program reports the readability, the average sentence length, and sentence length variety as well as the ratio of sentences in each grammatical form (simple, complex, etc.). Sentences longer than fifty words are listed for the writer to review. Fifty words seems long enough to be remarked. The program simply announces the percentage of complex and simple sentences. It is left to instructors to give advice about handling these facts. Here the machine is doing the tedious and repetitive, just what machines are for. And humans have the responsibility to make judgments, something they are at least better at.

It is the segment of The Writer's Workbench known as Organization that seriously arrogates a power the machine should not possess. Organization picks out the first and last sentences of each paragraph in the text being analyzed. It then prints these for the analyst with the idea that a writer should be able to see all the key ideas in these sentences since the topic sentences (the first) of the paragraphs will appear in this list along with the recapitulative and transitional (the last). The implication for the student writer using this part of the program, though the program does not intend this effect, is that the first sentence of a paragraph should always be a topic sentence. Here the machine tyrannizes implicitly. Even the most conservative handbooks allow the placing of topic sentences elsewhere and analysis of professional articles will show no such rigid pattern. Moreover, such uniformity of structure should never be encouraged. Here the machine has clearly seduced the designer of the program.

The Writer's Workbench seems to me a wonderful analytical tool. I would love to have my students made aware of some of their stylistic traits without the tedium of meticulous counting and without having first to train them to be marvelously swift and accurate if simple grammarians. The Writer's Workbench can give a

good basis to any student for stylistic editing. But it must not be allowed to present standards in such a way that students will be lead to write in only one stylistic form and certainly not in one organizational format.

Technology has given us great gifts in the past as well as in the present. The danger has always been that we let it, like fire, get out of hand. In the case of computers and English, we can learn to use this powerful tool. Let the computer take over the tedious, the repetitive, the mindless, but let us retain and let it foster our own human and even delightfully subjective judgment of relevance, taste and style. Let us be sure to make the computer a tool instead of ourselves the object.

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DANCING ON THE CUTTING EDGE: ENGLISH TEACHERS AND COMPUTERS

by
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They tell me computers are revolutionizing our world. And I, for one, am ready. As a post-Sputnik-child turned English-teacher-and-humanist, I welcome the exciting potential of high tech in my field--a field which has too often depended on history as an impetus for research and scholarship. Recently, I have been heartened to see so many of the major journals in our discipline publishing articles about the use of computers in the study of literature, composition, drama and the related fields of speech, music and art. Indeed, some of the journals have devoted full issues to the use of computers in the letters and arts. With each such publication I am tempted to think that English teachers have finally decided to give up one of their more traditional prejudices and enjoy the exotic fruits of the computer age along with the rest of the world.

In reality, however, I know that we are spectators rather than participants in the computer age. I would be hard pressed to identify more than three English or humanities departments in this entire country which have enlisted full force in the computer revolution or more than a handful of English and humanities teachers that have managed to bridge the technological and philosophical gap between their studies and their interest in computers.

Where I teach, in a technically oriented school, high tech is a presence with which poets and rhetoricians alike must reckon. And yet, even here, few faculty members use the two microcomputers or the large Univac computer to which we all have access. Among most members of my department, computers are ignored or eyed with a mixture of distrust and apprehension.

Why do English teachers and other humanities scholars dance so lightly on the cutting edge of the computer revolution? Why do we fail to take full advantage of the innovations in computer hardware and software that affect scholarship in our own fields? This article tells how thirty-seven faculty members in my department answered these questions. It explores both their fears and their expectations of computers. And while such a sample is too small to suggest generalizable findings, a close look at this one department may help us work toward a solution to the very real problem of computer "illiteracy" among English and arts teachers in this country.

An English/Humanities Faculty Talks About Computers

In the spring quarter of 1982, I asked fifty-four of my colleagues to complete a fourteen-item survey detailing their attitudes toward computers.

Forty-one surveys were eventually returned; four incomplete surveys were discarded. Of the completed questionnairs, 29 had been filled out by teachers of literature and composition, and 8 by teachers of other humanities disciplines. The results of these thirty-seven surveys are represented below:

Table 1: Survey of Humanities Department Faculty
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		Agree	Strongly Agree	Disagree	Strongly Disagree	Not Applicable
1.	I have avoided computers in the past.	4	10	12	4	7
2.	I am apprehensive about using computers because I am afraid of breaking these very expensive pieces of machinery.	2	2	17	13	3
3.	I have tried to use a computer before, and it made me feel stupid.	2	8	9	4	14
4.	It is becoming necessary for people in my profession to be familiar with computers and basic programming.	12	17	3	1	4
5.	I have tried using manuals and books to learn how to use the computer, and they have really helped me.	0	10	5	6	16
6.	I have tried to use a computer before, and it was very frustrating.	4	7	9	3	14
7.	I have not wanted to learn to use the computer because I have little or no access to one where I work.	0	7	15	5	10
8.	I have been interested in learning to use the computer.	7	22	3	0	5
9.	Since I know how to type, it should be easy for me to learn to use a computer.	3	14	10	2	8
10.	I have tried to use the computer before, and it was fun.	2	7	8	2	18
11.	Knowing advanced mathematics would make it easier for me to learn basic programming skills on the computer.	3	7	15	2	10
12.	I am apprehensive about using computers.	2	13	12	7	3
13.	It will take quite a long time for me to learn to use the computer. (Estimate the amount of time.)	0	14	10	0	13
14.	The computer is easily applicable to the kinds of things I do in my field.	5	18	7	2	5
15.	Most people feel as I do about computers.	0	5	14	1	17

Every question in the survey was not applicable to the experiences of every respondant (note the number of responses in the "not applicable" column in the preceding table). Therefore, all percentage figures in the following discussion of results represent the responses of individuals who marked one of the four "applicable" choices ("strongly agree," "agree," "disagree," "strongly disagree") on the questionnaire.

An analysis of the thirty-seven surveys that were completed by the English and arts faculty indicated three major findings:

1. A large majority of the faculty in my department was, in theory, very "interested" in learning how to use computers for work within their various disciplines. Several members, however, reported being "apprehensive" and "frustrated" about engaging in actual computer learning situations.

2. Most of my colleagues, while recognizing the immediate applicability of computers to their own particular fields, feared the "dehumanizing" influence of these machines.

3. A number of English and arts faculty responding to the survey were less than positive in evaluating past computer learning situations and in their expectations of future situations.

In this condensed form, however, these findings tell us little about humanistic logic behind the faculty's responses. For this reason we have provided a more detailed discussion of each finding in the following subsections.

Computers in General

Perhaps the strongest message communicated by this survey was the faculty's desire to learn more about computers. Of those 32 individuals checking an "applicable" response for Question 8, for example, 91% reported that they were "interested in learning to use the computer." In the comments section that followed each question on the survey, comments such as the following were representative:

> Computers are giants doing miracles, and I want to be friendly with them.

Even those colleagues who did not express an interest in learning about computers recognized that they were fast becoming an important part of a scholar's training:

> I'm not interested exactly. It's more a grudging certainty that I'll have to learn sometime.

And yet, while most faculty members agreed with the principle of learning more about computers, their motivation to engage in actual computer-learning situations was tempered, in many cases, by apprehension. Almost

half of the respondents, for example, admitted avoiding computers "in the past" (47%) and being "apprehensive" (44%) about using computers at the present time. One faculty member, in articulating this ambivalent attitude toward computers, described the machines as "enigmas" that were as "intimidating" as they were "fascinating."

Computers in English and the Humanities

If the surveyed faculty in my department had a somewhat ambivalent attitude toward computers in general, they seemed to agree about the benefits of introducing computers into their immediate fields of study. In fact, 88% of those faculty members marking an "applicable" response on Question 4 agreed that it had become "necessary" for people in their profession to "be familiar with computers and basic programming techniques." In addition, 72% of the faculty members agreed that use of the computer was "easily" applicable to their personal disciplinary interests. Moreover, these respondents seemed well informed about the kinds of tasks that computers could perform within their own humanistic discipline. Individuals noted that a computer could serve as a "mechanics instructor," "invention prompt,' and "research tool" in rhetoric, as an aid to producing "concordances" and "extensive bibliographies" in literature studies, and as a "tutor" and "text editing tool" in writing labs.

And yet, though they realized that computers had the potential for direct and varied application, the rspondants also reported a mistrust of the "mechanical" mindset that they recognized as an integral part of the computer revolution. Individuals felt that using computers in the classroom, for example, would mean abandoning a humanistic approach to the teaching of English and related studies. As one teacher explained:

> There is little enough humanity in so much teaching, and too many teachers tend to think the computers can do more than they are intended to do. I'm sure they ease the burden in research, but I know an individual who almost thinks they can teach a class.

Other faculty comments gave further evidence of this fear:

> There is a small part of my thinking that tells me computer work can be dehumanizing.
>
> I am...somewhat suspicious of them [computers].

One factor that seemed to increase this distrust of computers was the use of "computerese," that technical jargon which some faculty members saw as obfuscating any discussion in which computers were mentioned. In general, this language was found to lack 'any kind of charm or appeal," to be "mechanical and devoid of imagination," and to be "utterly and terrifyingly confusing.' Perhaps even more importantly, individuals reported that the jargon of computer literature and "computer jocks" fostered an "us vs. them' polarity that hindered their attempts to collaborate with computer experts in undertaking projects.

Learning to Use a Computer

If the teachers in my department were interested in computers in a general way and knowledgeable about the various projects in which computers could be gainfully employed, they were somewhat less positive about their ability to "learn" how to use computers. For example, almost half of the 23 individuals who had tried to use a computer at some time in the past reported that the experience made them feel "stupid" (43%) or "frustrated" (48%). One colleague recalled:

> ...I was allowed to use a computer for two or three minutes at an Open House, but the guide was so overbearing and garrulous about the potentials of the machine age that I left....When I have had experiences with such machines in the past, frequently they don't work. In most cases, I do not allow myself to become frustrated; I simply walk away.

When asked to estimate how long it would take them to learn to use a computer for their own purposes, 58% of the faculty agreed that such a task would take "quite a long time," although actual estimations ran from "several hours" to "several months." These estimates might have been influenced, however, by misconceptions about computers held by some of the faculty members responding to the survey. Ten individuals, for example, thought that "knowing advanced mathematics" would help them in learning basic programming skills. As one individual remarked:

> I'm afraid you need math to understand computers, and math and I are like oil and water.

Moreover, 17 teachers felt that simply knowing "how to type" would make their learning task easier. Four individuals confessed that they were hesitant to use a computer because they were afraid of "breaking" the sophisticated machinery.

Some of the individuals who responded "quite a long time" when asked how long it would take them to learn to use a computer, had based their estimations on experiences with computers in the past. For example, 8 faculty members reported having negative experiences with using books and manuals designed to teach programming or text-editing skills. The following comments are representative of their responses:

> I have yet to learn one thing from our computer manuals.
>
> I have tried them [manuals], but they are frequently confusing, and poorly written.
>
> Computer literature must be written for someone, but I'm obviously not the audience. Sometimes I wonder if the authors aren't the machines themselves. Who else writes like that?

Adding to the faculty's discomfiture about learning how to use computers was

the suspicion that their feelings about computers, their fears about engaging in computer learning situations, their concerns about the possibility of dehumanized education, and their confusion with the garbled, abstruse rhetoric associated with computer literature were not shared by "most people." Several individuals seemed convinced, for example, that such feelings, rather than being part of a normal and perfectly healthy skepticism, were in some way "archaic" markers of a generation past. As one faculty member put it:

> Only people my age (39), without the proper math and computer background, feel the way I do.

Conclusions

It is hardly startling to report that one rather small department of English and humanities teachers has resisted making a full-fledged commitment to computers or the technological wizardry and arcane language that surrounds them. The reservations of my colleagues, however, may provide some insight into the nature of computer involvement or avoidance in English and humanities departments across the country.

First, the members of my department, like the majority of English and humanities teachers in this country, have yet to subscribe with total enthusiasm to the values they see as part and parcel of the computer revolution. Some of our resistance, of course, has resulted from the nature of our training as humanists. We are encouraged as we study literature, rhetoric, drama, art, and music to celebrate the "humanity" of the process and the product. We are encouraged to be creative, rather than mechanical in our approach. Computers, however, are not human, not creative, and we are not at all familiar or comfortable with their plodding mechanical logic that is incapable of imitating the inductive pirouettes and grande jetees of our own thinking. Our resistance also stems from habit, however. Traditionally, we have been unconcerned with efficiency in administration or production, with the quantity of "things" that we turn out or the speed with which we create them--all those concerns for which a computer, a machine rather than a human, might be the answer.

Second, we are afraid of computers. They are not made of the stuff with which we usually work--words, notes, strokes of pen or brush. They contain components we cannot imagine, working in complex interactions we cannot identify. To make matters worse, we are afraid of the people who work with computers. They speak in tongues even our linguists cannot interpret and use our own language to write books and documents we cannot understand. The hardest part of this situation, however, is the humiliation we have to suffer to make friends with these electronic devices and the people who maintain them. If we want to learn to use computers we have to declare ourselves as the rankest of beginners. Sometimes we cannot even find classes that are suitably elementary for our purposes, and we have to compete in college courses with younger students who have been raised with computers, who know two or three different computer programming languages before they ever enter their first college course. These students, who have grown up with calculators, video games, and home computers, even know how to <u>think</u> like a computer and have an

intuitive grasp of what these machines can and cannot do. Most of us, on the other hand, must overcome patterns of thinking that we have practiced for decades before we can learn to follow the binary logic of computers.

Somewhere between our fears of computers and our realization of their potential lies our dilemma. We cannot ignore the humanitarian benefits that computers offer in our field--the unlimited patience in tutoring situations, the ability to relieve homo sapiens from the drudgery of repetitious and boring labor, and the capacity to perform research tasks in minutes that would require years of painstaking human scholarship. But, at the same time, we sense that many of the values embraced by the computer revolution are antithetical to the study of English and the humanities, and we dread the task of "starting over" as beginners in a totally new field.

The dilemma will not resolve itself. Our own scholarly preparation, which even now takes longer than many of us would like, leaves us little time to master the new fields of computer programming or computer science. What smattering of computer skills most of us do bring to our first jobs has been learned in those rare moments we have allowed ourselves away from our primary scholarship.

We can, however, begin now to design programs that will make humanities scholars into educated, "literate" computer users. To be successful, such programs will have to address the special needs of an arts and letters faculty by including some variation of the following components:

Consultants

Many English and humanities faculty members have good general ideas about how computers could be used in their own scholarship. Most, however, have no specific ideas how to actually get computers to do their bidding. A department facilitator, with background in both computer science and the humanities, can be useful as an advisor to faculty who are planning computer projects. Facilitators can advise faculty on the feasibility of their computer plans, help them write and implement programs of computer-assisted instruction, maintain lists of teachers in the local area who are amenable to being consulted on computer projects, and inform faculty about existing commercial software that might fit specialized needs.

Hardware and Software

The decreasing cost of computer components and the rapidly increasing numbers of micro and minicomputers on the market now make it possible for most schools to own their own computers and text editors. To encourage computer literacy among English and arts teachers, these hardware systems must be made readily available for faculty use. Locating computers at a site removed from most classrooms or failing to schedule sufficient time for faculty use of computers will not encourage English teachers to learn or experiment with systems.

Providing computer hardware for faculty use, however, is only a first step. Appropriate software (computer programs) must also be made available. Because most faculty will have neither the time nor the expertise required for programming their own materials, they will have to purchase commercially published software or hire programmers with whom they can undertake collaborative efforts. Either alternative will require funding. For this reason, a firm financial commitment to computer literacy for the humanities must be clearly established before any program is begun. Committees of teachers, formed around pedagogical or scholarly interests, should be set up to review and test published programs before they are purchased.

Computer-Education

The hardest step for non-users is the first. Any large scale program designed to make English teachers "literate" computer users should start with a series of non-threatening introductory courses focused on topics of interest to a particular faculty--"Using the Text Editor," "Understanding Microcomputers," "Designing Computer-Assisted Instruction," etc. Ideally, such courses, taught by persons with expertise in both computer programming and humanities studies, would help new users develop confidence and encourage their further experimentation with computers. Later, more sophisticated computer courses can build on the knowledge provided by these initial classes and expand into areas of specific interest for individuals and small groups.

Support and Funding

The success of a program in computer literacy will reflect the amount of support it is afforded on a departmental and school-wide basis. Facilitators cannot consult with faculty unless they are given adequate release time; the purchase of computer hardware and software, and the development of computer short courses cannot take place without funding. And although new expenditures are difficult to rationalize in these days of tight budgets and cutbacks, we must support programs in computer literacy if we hope to produce new and exciting scholarship and teaching that takes advantage of technological advances. Indeed, many departments may find that a computer literacy program will begin to pay its own way--saving money in a writing lab with computer-assisted tutorial, saving additional secretaries' salaries by introducing computerized text editing, and revitalizing teaching efforts through computer-assisted instruction.

Even if all these components are combined, however, any program designed to encourage computer literacy among English teachers is bound to face some serious difficulties. Unlike Athene, confident computer users will not spring full grown from English and humanities departments with only minor headaches to herald their appearance. Rather, teachers in arts and letters will continue to be slow and deliberate about accepting computers. To make these machines more attractive, we must load the dice in our favor and make sure

that the top level of school administrators realize the necessity of providing a highly supportive network of facilitators within the school, adequate hardware and software, and attractive educational opportunities for teachers. Only then will English and humanities teachers begin to take advantage of the innovations that are taking place and learn to dance more confidently on the cutting edge of computer application.

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COMPUTERS AND THE OBSOLETE ENGLISH TEACHER

by
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This past spring a university-owned van traveled along a Michigan interstate towards the CCC Conference in Detroit. Inside, seven people hotly debated the future of English teachers in a classroom filled with computers. One person described a scenario in which computers not only performed much of the instruction, but also did all of the grading--both essays and technical reports. Others argued that computers will never read context, and thus never be able to help beginning writers focus their ideas. A compromise group allowed that these machines will perform the grading, but only after overcoming tremendous ethical and logistics problems. I wish to argue that such problems will be overcome, and computers will indeed be doing most of the work now performed by you and me. The marketplace in virtually all occupations will change dramatically in the next ten years, for computers will assume an increasing number of duties commonly performed by human beings, including the teachers of English.

Popular magazines often show robots on the automobile assembly line, reminding us that computers perform many jobs formerly accomplished by auto workers. We also know that computers are slowly replacing people in other fields, not all of them blue-collar areas. For example, many companies purchase word processors not merely because they make revising easier, but because the machine's purchase eliminates the need for another secretary. The history of technology shows us an increasing movement away from labor intensive jobs, and as we learn how to develop more skillful computer programs, no field will remain untouched. Why should teachers and other professionals feel immune to these changes?

In business, the shift away from human labor is due to two factors: high salaries and a more competitive marketplace, principally from competition overseas. The current state of education is not significantly different. As in most businesses, the major expenses in education are salaries, and we also now find ourselves in a competitive market, trying to attract the declining numbers of freshmen into our college rather than another down the road. State governments and the governing boards of private schools must realize that those institutions which survive must maintain their academic rigor, yet diminish costs. In the past two decades savings were realized by placing underpaid graduate students into the undergraduate classrooms. Declining job opportunities for academics, however, have diminished the numbers in graduate schools, and thus savings must come from another

area--that area will be salaries. While computers are now regarded as necessary supplements to education, before long they will be alternatives to new staff.

Some of us might answer that we have skills computers will never duplicate, and that is true. Robots will not soon be comforting a crying elementary school child with a bruised shin, although writers of science fiction make a credible prediction about such a possibility (see Ray Bradbury's "I Sing the Body Electric"). Nor will machines offer the intellectual confrontation of a teacher in a literature class. One of my greatest pleasures as a teacher occurs when I am able to generate a class discussion involving multiple student viewpoints, and then sit back as ideas criss-cross the room. Much of this excitement occurs because of the physical proximity between students. This interaction between students is an element that present technology has only duplicated in a superficial way.[1]

Although students working in front of computer displays lack the physical presence of others, they engage in activities that are more efficiently and skillfully performed with a computer. Word processing is the most obvious example. Current research in the composing process shows that rewriting is of major importance, and computers eliminate much of the drudgery of this activity. Similarly, free writing, topic-generating, and some forms of proofreading are better left to the microchips. Everyone prefers variety, however, and thus students in the classroom of the future will not sit continually before a video display, but will shuttle back and forth from teacher to computer. More and more time, however, will be spent with the latter because computer programs are getting better at teaching.

Many of us may confuse computers with the piles of language lab equipment purchased by so many schools in the 1960's and that now sit unused in the corner of a closet. Students quickly discovered that sitting in front of a slide tape machine was as exciting (and thus pedagogically useful) as watching dust form. The principal limitation of such devices is their inability to interact with students. For learning and thinking to occur, individuals must participate physically, for this encourages cognitive activity. Passively watching a film canister unroll requires virtually no physical and mental effort, but a computer can demand and expect more complex student responses.

Early computer-assisted instruction (CAI) programs were little more than traditional language lab machines with a keyboard, and students were usually required to merely tap on one or two number keys in the multiple-choice type lessons they offered. More recent programs allow students to communicate with standard English sentences, and with this greater simulation of normal human communication comes an increase in interest as well as greater learning. My family owns a home computer that is primarily used for word processing. However, the machine does allow a few games, including a simplified version of the famous artificial intelligence program written by Joseph Weizanbaum at MIT. "Eliza" simulates responses from a psychiatrist to a patient, and the conversation resembles normal human interaction, albeit the words appear on a video display. My sixth grade daughter is fascinated by the machine's ability to "answer" her questions, and she discusses problems (mostly social) that beset eleven year-olds. She willingly suspends disbelief, primarily because this program operates so closely to normal conversation.

The version of "Eliza" on our home computer is primitive compared to some computer-assisted instruction modules now being used. Using more refined

techniques and a larger number of potential "answers" to student questions, Hugh Burns of the Air Force Academy developed programs that assist students in brainstorming ideas for writing assignments.[2] Students respond to prompts by writing phrases or sentences onto a computer screen. The program "remembers" parts of the students' responses, recalling them as needed to help the writers narrow and focus ideas. Since these programs demand responses in the form of a written phrase or sentence, the user is forced to pay attention. But the importance of Burns' work is in the nearly normal conversational techniques that occur between student and computer. With this high degree of verisimilitude individuals using the program must remind themselves that they are communicating with a machine.

If we accept computer simulation of human written communication as increasing a machine's teaching effectiveness we might wonder if further improvement is possible. The most natural method of human communication is speech. Computer voice recognition has long been recognized as the next major breakthrough, and its use in CAI should revolutionize the use of computers in schools. When students can "talk" to these machines, they will suspend disbelief even quicker and accept computer programs as nearly akin to human teaching.

Computers will also be grading student essays and reports. The technology for this began almost twenty years ago, in 1965, when Professor Ellis Page, then at the University of Connecticut, wrote a program that graded 256 high school essays. The resultant grades, when compared with the grades of four experienced high school teachers, could not be told apart.[3] The project was abandoned because of the high cost of making the essays machine-readable: they were all translated to computer cards. With demand terminals and microcomputers, however, that technical problem is no longer insurmountable.

When I tell my colleagues that computers will be handling the drudgery of grading in the future, they are both relieved and skeptical. While many agree with me, they wonder about the problems such a process would bring. For example, won't there be mighty disagreements among teachers about the formula for such a program? Won't budding great writers who compose differently be missed by a computer? Won't students try to learn how the program operates and attempt to subvert it? The answers to all of these questions is Yes.

Computers will make major changes in the classroom, but they will not change human nature. Teachers now debate teaching methods and grading concepts, and teachers in the future will also argue about methods used in the computer programs. Some students now cheat, and others will cheat in the future but on a different (not necessarily higher) plane. The computer may also fail those students who write like Hemingway or Joyce. But, as Dr. Page pointed out in 1965, such students are often flunked in traditional classrooms as well. They may, however, be missed less often with computers, depending upon the skills of the program.

With machines performing so many traditional classroom functions, will teachers be necessary at all? Certainly. Computers cannot presently write their own programs, and they cannot offer solutions to the major ethical problems inherent in my scenario. Teachers must decide on the grading levels given by the grading program, and they must determine the effectiveness of different programs. While teacher committees now decide which textbooks the school system must purchase, committees in the future must decide which

programs to purchase, and which ones need adjusting for local students' needs and concerns.

Although we will have far fewer teachers, some will remain working in the classroom. Computers will handle most activities but machines lack certain important skills. For one, they are not spontaneous. Programs must be written well in advance of use; teachers, however, can react much more quickly to major changes in assignments or content. Second, the traditional classroom permits an element most humans prefer: human interaction. The social interplay in schools is extremely important, and students will prefer at least part of each day spent in a setting where such interaction is possible.

Computers will replace some teachers, but we need not worry about mass firings. The diminishing numbers of students will end some teaching careers, but computers will more likely replace "positions" rather than "persons." Attrition will be the key. Administrators (who shall, of course, diminish in number with the teachers) will realize that the retirement of one teacher does not require the hiring of another. Instead, the remaining staff will share the additional load from this position with a classroom full of machines.

A recent news article states that Stanford University students who enroll in a particular philosophy class may select a section taught by a teacher, or one taught by a computer. The article does not indicate which is more popular, nor does it explain how the professor feels about competing with a machine. English teachers should watch such developments with interest because computers already are widely used in composition classes. Before too long they will be our colleagues.

FOOTNOTES

[1] I am thinking of computer "networks," in which students at consoles can communicate with each other through "electronic mail." At least one university has students critique each others' papers by logging on to a large mainframe computer (at any time) and reading what their peers have written. However, the missing excitement of the moment and the physical presence of other students must certainly diminish the effect.

[2] Hugh L. Burns and George H. Culp. "Stimulating Invention in English Composition through Computer-Assisted Instruction. Educational Technology. August 1980, 5-10. For more background in new methods of computer-assisted instruction see William Wresch, "Computers in English Class: Finally Beyond Grammar and Spelling Drills," College English, vol. 44, #5 (Sept. 1982), 483- 490.

[3] A number of articles appeared after "Project Essay Grade." See Ellis B. Page, "The Use of the Computer in Analyzing Student Essays," The International Review of Education, vol. 14, #2 (1968), 210-224; or Arthur Daigon, "Computer Grading of English Composition," English Journal, vol. 55 (January 1966), 46-52.

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THE TRADITIONAL TEACHER AND THE NON-TRADITIONAL STUDENT

by
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The traditional teacher, trained and experienced in teaching literature and expository writing to the traditional college-age student may now more than ever find herself searching for new resources when she meets the varying challenges presented by the current influx of non-traditional students.[1] This is particularly true at the technical college, which is attracting a growing number of older adults hoping to learn new skills that will make them employable, or upgrading skills that will help them advance in jobs they already hold. Another group of non-traditional students coming to college are those with academic deficiencies, learning disabilities, or physical handicaps. Whatever their particular distinction, non-traditional students have individual needs that may require the traditional teacher to go beyond both syllabus and conventional method to find the appropriate instructional strategies to meet these needs. As a writing teacher in a competency-based program that allows for self-paced learning in a one-on-one instructional format, I have recently found myself in just this situation--adapting materials and searching for new techniques. A microcomputer, a word-processing software package, and a media technician helped individualize the writing instruction of a physically disabled student.[2]

"This is neat," was the message Kris typed out on the monitor when I introduced her to the Apple II microcomputer. A childhood victim of cerebral palsy, Kris maneuvers her motorized wheelchair with agility, but she has difficulty speaking and writing. In a traditional writing class she could not have participated in discussions or composed papers during a regularly scheduled class hour. However, the same course offered in a self-paced mode allows her plenty of time to complete assignments and flexibility in how she will complete them, as well as individualized instruction, and to her great delight, the opportunity to compose her papers on a microcomputer. Using a word-processing program, Kris can key in her essays, edit them, and have them printed out in hardcopy for submission to her instructor.

Attending college was a challenge for Kris; teaching her was a challenge for her writing instructor. Kris's inability to articulate clearly in speech her thoughts and her questions was at first a barrier to establishing an interactive learning situation which is so important a part of the self-paced mode of learning. However, I soon got used to reading the messages Kris spells out on her wooden alphabet board, letter by letter, and was often able to anticipate the thought she was spelling out before she had completed it. Kris was not the only person learning; I learned to "read" her gestures and body language and even to understand her speech. Some allowances were made for Kris's physical limitations; for example, while other students are required to write under supervision, she was allowed to take her assignments out so that she

could type them--using one finger. Yet as Kris worked her way through the first composition course, I knew that the second course, which requires the writing of a number of essays and a research paper, would be more difficult for her, simply because of the greater amount of longer writing assignments.

When a microcomputer became available, it seemed worth a try to have Kris use it to write her assignments. She responded eagerly to this suggestion. Using the keyboard was no problem; it was even easier than using the typewriter because it requires a softer touch. She did not have to exert as much physical effort and, consequently, could concentrate more on the composing process. Revising was easier, too. Kris quickly learned how to edit her compositions, which made for neater and more correct work than any she had been able to produce by typing. I soon realized, however, that Kris needed to be producing more than text on a monitor, for the assignments were getting longer than the screen would hold. Besides, it was not always convenient for me to evaluate what she had keyed in as soon as she had finished. We needed a way of saving her work for later evaluation.

This is where a word-processing program came to our rescue. Again, two of us were forced to learn: I, to use the program so that I could teach Kris; she not only to write essays, but also to save them on a disk, to edit and revise them so that we could get printed copies of them. Working with the software manual, we learned to use the editing procedures and the system commands so that copy comes off the printer with properly indented paragraphs, with capitals where they should be. Always, we had the cooperation and the skill of the college's Media Center technician. As a result of a need, a probable solution and three people working together to make it succeed, the program now has another resource for instruction and--in this instance--for making it easier for at least one student with special needs to meet the minimum competency requirements. Used in this way, the computer is, in the words of Richard S. Powers, "an additional tool to help us reach our goal of truly humanistic instruction."[3]

I was particularly struck by the response of other instructors and staff when they saw the printed copies of Kris's essays. They expressed surprise at the level of her ideas, the maturity of her language and style. These reactions reinforce Kris's own observation in her journal--that one of the greatest problems she has had to face throughout her twenty-one years is the attitude of "normal" people who assume that because of her physical handicaps she is mentally deficient, that she is incapable of "normal" academic proficiency; that because she cannot communicate orally she cannot read with understanding; that because her handwriting is difficult to decipher the ideas it expresses are inferior. In fact, Kris has learned tolerance for these misapprehensions of her abilities, but she responds enthusiastically when challenged to exercise them.

I, too, have been guilty of underestimating Kris and have sometimes been apologetic for asking her to complete a task that for any other student would be simple. For instance, on one occasion I expressed my satisfaction for her efforts at getting through a particularly trying assignment by saying foolishly, "Thank you for doing this for me." To which she replied by calmly spelling out on her alphabet board, "I'm doing it for me." There was no mistaking the tone or the attitude back of that remark. It put all our mutual efforts into per-

spective. Our motivation was the same--to ensure that Kris get the full benefit of the education which means so much to her and to which she has as much right as any other student.

In recent years many non-traditional students have come through our program; all of them have particular needs that are best met by personalized instruction and interaction, which demand extra energy, patience, and initiative. Working with non-traditional students, whatever makes them non-typical, often requires going beyond the prescribed assignments or exercises in a workbook or even normal limits of involvement, but the rewards are ours as well as theirs if we do.

NOTES

[1]For an overview of statistics on non-traditional college students, see Lynn Quitman Troyka, "Perspectives on Legacies and Literacy in the 1980's," College Composition and Communication, XXXIII (October 1982), 253.

[2]The PACE (Personally Accelerated Career Education) Program at Hocking Technical College provides an alternative to traditional classes. PACE courses are open-entry/open-exit, allowing for not only instructional but also scheduling flexibility.

[3]Robert S. Powers, "Computer-Assisted English Instruction," Education in the 80's: English. R. Baird Shuman, ed. (Washington, D.C.: NEA, 1981), p. 112.

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COMPUTERS IN ENGLISH: IS THERE ANOTHER WAY?

by
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Let it be known at the outset: we believe in computers, and in the potential of instructional applications of the ubiquitous little machines in the English classroom. If there are those among you who cling to the notion that the future of the microcomputer in an educational setting is still unproven because of all the "garbage" software you've reviewed, perhaps the following discussion will pique your interest.

The ease of developing lower level computer software and the limited area of language arts curriculum that are amenable to computerization are largely responsible for the less-than-ideal quality of software currently available. In spite of our complaints, however, we often encourage software developers to continue their publishing decisions through our somewhat archaic approach to software selection and use. Perhaps we need to step back and look objectively at the unique roles of both computer and teacher in the language arts classroom.

Both the content domain of English, reading, and the other language arts, coupled with the current state of the technology, have limited computer applications in English. On the one hand, many areas of the content cannot be specified by well-formulated rules or procedures that can be modeled on a computer. On the other hand, in areas where there are such rules, it is not infrequently the case that either the relatively inefficient processing of the microcomputer makes the student-computer interaction so painfully slow that potential benefits are lost or the level of instruction of the software lesson is inappropriate for our instructional goals.

To illustrate these situations, consider the activity of writing a well-structured paragraph with a main idea and appropriate supporting details. It's not possible to specify rules so that a computer could judge whether a student's original paragraph is appropriate. However, there are examples of lessons that lead a student through this process of paragraph development by asking structured questions to focus students' attention on various aspects of the topic. The program stores student responses to ostensibly produce a

well-developed paragraph with a main idea and supporting details. On the surface this seems ideal, but there is no way the computer can be programmed to guard against the student responding with nonsense.

Because of the lack of specified rules or procedures in many areas of language arts instruction, software developers have been producing programs that, for the most part, are drill and practice lessons on those aspects of the English curriculum that are defined parts of speech identification, spelling, vocabulary, punctuation, and syntax. While tutorials are starting to appear on the market that deal with cloze procedure, sentence combining, and general comprehension, you need enough experience with computerized interactive instruction to evaluate any software knowledgeably, or need a resource that provides thorough, current software reviews.

The typical pattern for many English/language arts teachers has been to discover relatively high quality computer lessons (either through personal evaluations, published reviews, or word-of-mouth recommendations), and then to search for a place in the curriculum where the "neat" lesson would fit. Keran has suggested that experimenting with programs developed for other disciplines, such as social studies, is an effective method for you to use in shopping around for applicable computer programs (1983). Software developers have been using the same approach.

Up to now, most developers have been designing lessons that focus on easily computerized topics, without a broad perspective on the instruction needed for a comprehensive teaching unit. They have not focused on the unique partnership of computer and teacher by acknowledging the curricular areas that are best handled by each. As a result, we have what could be described as a "kite-tail" curriculum: because the software has been developed without the teacher and computer roles in mind, packets of programs on diverse topics have been produced. The teacher has been left to select lessons from various developers, tying them together as one ties together different lengths of cloth for a kite tail until it seems to "fly right." The computer-using teacher is assuming, by default, the role of curriculum director rather than of curriculum developer.

We propose that there might be a better way to implement computer capabilities in language arts instruction than the searching-for-software strategies we've described. Instead of opening a space in a lesson plan for a well-prepared lesson on subject-verb agreement, much as you would schedule a film on the Holocaust during a unit on <u>The Diary of Anne Frank</u>, consider the possibility of looking closely at what you teach,

then deciding what aspects of that content could be computerized and what instruction you must deliver. Being ultimately responsible for the instruction that goes on in the classroom, you should decide exactly what material would best be handled by the computer instead of taking pot-luck from the offerings of commercial software publishers.

Before you can make a decision about what aspects of your instruction a computer could deliver and give software developers that information, you need to be familiar with computer capabilities and limitations. The strength of what is commonly referred to as frame-based instruction (because information is presented in the "frame" of the computer screen) is forged in the computer's ability to continuously provide consistently presented instruction and immediate reaction or feedback to student responses. The computer has been referred to as "incredibly fast, incredibly accurate, and incredibly stupid" (Standiford, 1983). It can only react to student responses that it "recognizes" by matching them against material (number or character strings) already programmed into its memory.

What aspects of what you teach have specific, identifiable traits that can be modelled on a computer? These traits must be so well-defined that a computer program can test for their presence or absence in student responses. This need for content to have readily identifiable characteristics is one reason why so many programs developed for language arts are of the fill-in-the-blank, multiple choice variety. They require specific right answers that, in less complex lessons, must be correctly spelled so they can be checked against the answers that are listed in the program. This doesn't preclude the possibility of more sophisticated lessons that could be developed, however.

For example, a lesson on plot development could be designed that would branch in any of several directions to offer instruction or to ask questions based on input supplied by the student. The student would need to choose from three or four suggested plot directions, each of which had identified in the program a bank of key words for each plot possibility. The program would then ask the student certain questions to be assured that the plot development continued logically. Student input would be parsed for the key words and subsequent branching would be based on the presence or absence of those words. This kind of lesson presents a challenge for the programmer, but is possible.

Not so possible would be the lesson that allowed for any plot suggestion from a student. Such open-ended input would

require the lesson designer to brainstorm every plausible plot and to identify key phrases that might be associated with each--a mind bending task, to say the least!

Another example of a workable lesson that would go beyond the parameters of drill and practice combines skills development in both reading and writing. Much research has alluded to the benefits of teaching students to use survey or skimming strategies such as SQ3R, SQ4R (which adds Record to the Read, Recite, Review triad) to improve their reading comprehension (Paulson, 1980; Thornton, 1980; Diggs, 1972). Other studies have suggested methods to help students identify the main ideas in their texts (Baumann, 1981; Bartlett, 1980).

A lesson that could offer practice in these areas as well as in writing an accurate precis or summary might involve identifying key words for a passage of text. A study conducted with college students indicated that students who skimmed a selection and read it once performed as well on tasks of reading comprehension as students who read the entire selection twice, suggesting that skimming is an effective and efficient previewing strategy (Jacobowitz, 1980). As they skim, students attempt to remember key words that they then use to paraphrase main ideas after skimming. Such an exercise, while effective in a paper and pencil medium, would be even more powerful if offered on a computer.

Instead of waiting to have their key word list validated by the teacher before setting about the task of producing a summary, students could get immediate feedback on the accuracy of their selections. The computer program would contain the prose passage and relevant key words, along with irrelevant key words and appropriate messages explaining their irrelevancies. Assured that their skimming practice has produced accurate key words, students could then set to writing a summary that was correct in content, if not in sentence structure.

You as the teacher would then read and comment on students' precis developed from the key word identification. While the computer can react with a list of precoded key words, it cannot judge the effectiveness or logic of prose. To carry the exercise one step further, the computer could then present several related passages from which the student would be required to generalize common strands and produce another summary identifying those strands. A list of generalized key words could be judged by the computer to be sure the student had identified a sufficient subset (with no irrelevancies) to include in a summary. Once again, you would read and comment on the precis.

Such a program could allow you to insert the passages to be read and to list the key words (and irrelevant words) necessary to complete the assignment. The computer is not yet totally capable of identifying good writing style, although programs have been developed that recognize overuse of passive voice, to be verbs and nominalizations, for example. The reading and writing lessons we've described could easily be augmented by the computer, as could other lessons in the language arts content domain, once English teachers have identified the curriculum content and objectives that are best taught by computers.

Shostak believes that "as quickly as possible, English teachers should and must demand effective computer literacy training" (1983). With a sound understanding of how the computer functions and what it is capable of doing as a learning tool, you will then begin to better conceive the possibilities inherent in using computers effectively in the English classroom.

Effective use requires software that is designed to be adaptable and capable of being integrated into the curriculum, with the teacher in mind. You need to articulate what instruction you'd like the computer to deliver and to take an active role in analyzing your curriculum for computer possibilities. You need to be able to demand the best, rather than simply choosing the best from the mediocre.

An excellent resource for information on computer applications in reading and the other language arts is the ERIC Clearinghouse on Reading and Communication Skills. Contact the Coordinator of User Services, 1111 Kenyon Road, Urbana, Illinois 61801, (217) 328-3870 for a free packet of materials. The Clearinghouse is sponsored by the National Council of Teachers of English, an organization that is taking an active role in disseminating information on the new technology in the English teacher's content domain. Be informed, be articulate, and let software developers know what kinds of programs would be useful in your classroom.

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COMPUTERS AND COMPOSITION: AN OVERVIEW

by
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Caught in a Tofflerian world where the rate of change astounds even those of us who have espoused Toffler's dictum that change is changing, we look around and see amazing ventures in high technology which our students seem to accept with no sign of apprehension. John Culkin reminded us in 1968 that a lot of things had happened in the previous 20 years and that most of them plugged into the wall. "Don't say it can't be done because tomorrow someone will have done it" has become, in the field of computers and composition, "Don't say it can't be done because someone did it five minutes ago." Since most of our students have been born into this world of media bombardment and technological control, they can't, of course, realize from the perspective of years and history just how great these changes are.

Consider that you can buy a kit from Heathkit and build your own robot. Robotics, as a field of high technology, is expanding so fast that we have in Kentucky and Tennessee plants where nearly all the manufacturing work is done by robots. In California, we find a robot being used to instruct medical students. Consider that just as we are starting to understand that the silicone chip and sand are somewhat the same, the British are working with Josephson's Junction, a new kind of chip that uses cold as its medium for transmitting messages; of course, supercomputers are making chips obsolete. Consider these new supercomputers, capable of handling 150 million operations per second (as compared to several hundred per second on a personal computer). Having realized you can't comprehend that many operations, look at the new supersupercomputers coming from Hitachi and Fujitsu, capable of performing 10 billion calculations per second. (Chicago Tribune, March 29, 1983). Who uses or needs such supersupercomputers? One of the major purchasers seems to be the United States government, which uses this capability for code-breaking.

Look in a different direction, from large to small. One of my students this semester did the correlations for his research paper, as well as the data processing and word processing, on his Sinclair ZX81, a British-made computer kit that cost him about $100. He built it, then added the necessary peripherals for another $100. The student is a philosophy major. The new Gridstar is a $10,000 book sized computer which stores an immense amount of information and which can be networked into a main frame computer through a modem for immense operations, considering its size. ("Networked" and "modem" are neologisms which can be fought on traditional grounds, but denying new words for new concepts in new fields of research and development has never done English teachers or their students much good. Those who wanted to return to Shakespeare's perfectly acceptable use of "ain't" were frustrated, too.)

If, then, you see yourself as a Luddite who wants to commit technocide, your chances of making a difference with your protest are relatively slim, as slim as the efforts to remove "Ya' know" from our students' vocabularies or to mark "orientate," as in "I was orientated," as a nonword.

Douglas Adams, in The Hitchhiker's Guide to the Galaxy (Pocket Books, 1979) presents us with a supercomputer which is given seven and a half million years to answer the questions, "Who am I? What is my purpose in life? Does it really, cosmically speaking, matter if I don't get up and go to work?" Before the computer gives us the answer to the question of the meaning of life, we find a group which presents itself:

> "We are quite definitely here as representatives of the Amalgamated Union of Philosophers, Sages, Luminaries and Other Thinking Persons, and we want this machine off, and we want it off now! . . . The Quest for Ultimate Truth is quite clearly the inalienable prerogative of your working thinkers . . . . We demand rigidly defined areas of doubt and uncertainty!"

As English teachers, we have often demanded "rigidly defined areas of doubt and uncertainty." In a world where binary thinking extends beyond the electrical impulses of the computer into a point of view toward all matters, be they physical or philosophical, such a demand is perhaps good. However, we cannot forget our obligation to help our students understand their world as well as ours. As Jake Page reminds us in the November, 1982, issue of Science, '82, "To moan about new technologies disrupting the social order--instead of thinking about how to make new technologies work better--is to look at your hand and wish it were a paw."

The microcomputer as a tool then becomes our concern. ". . . (T)o look at your hand and wish it were a paw" is an apt analogy when looking at the fact we have always used tools in order to write. Writing and then publishing what we write have always been the results of technology. Caxton and Gutenburg are remembered for their technological innovations, not for their literary contributions. On a personal level, we each have a history of having advanced in our writing as the use of tools by which we write has advanced. After Mother took away my crayon and made me wash the wall on which I had been writing, she gave me a pencil and paper. This was my first change in writing tools. The antique manual typewriter I got as a gift when I was eight gave way to the portable typewriter I received when I graduated from high school. When I first used an electric typewriter at school, I quickly wanted a portable electric to use at home. My first experience using a Selectric I led quickly to the desire (perhaps need) for a Selectric II, since that little button with an "X" in the lower right hand corner is very handy, an "automatic eraser" designed for someone who types as I do. I now sit at my Apple II+ and think of the Apple IIe I'll be using this fall as I envy my colleague in Victorian literature who is purchasing an I.B.M. personal computer this week.

From pen and quill through microcomputer, the tools of writing have constantly changed as the technology of the culture has changed. Ask yourself which you value more: the book as a physical object or the ideas that are in the book. The history of books is the history of technology. Indeed, if one

wants to deny the necessity and contributions of technological change to our profession, then hard-bound books are questionable, since handcopied manuscripts are more closely related to the actual process of writing. We have got to realize that print and paper technology is already starting to appear primitive.

In the chapter titled "The Death of the Printed Page" in his book The Micro Millenium (Washington Square Press, 1979), Christopher Evans gives cogent reasons to back his claim of the superiority of the computer over the book. Size of the basic data unit is a very important matter, as is cost. More importantly, the book is at a disadvantage since it both stores and displays the information, where the microchip stores while the computer displays. Because of this basic difference, interaction with the information stored is possible through the computer, where the book in and of itself is essentially passive. Consider this possibility: you go to bed and put the microchip of your favorite Dickens' novel into your leather-bound, book size microcomputer. You set the timer, since you know your reading pattern well enough to realize you will fall asleep in 20 minutes. You display the print on the ceiling of your bedroom, adjusted to your eyes so that you can read without your glasses. After you quietly and pleasantly drift off with visions of Little Nell dancing through your mind, the computer turns itself and your reading light off. (The preceding is not fantasy.)

Why not fantasy? Anyone can now buy Deadline, 35,000 copies of which were sold in the last two years—at a price of $49.95. Deadline, "published" by Infocom, is a computer game that is closer to being a genre of fiction since it is a participatory novel (also called interactive fiction and "participa-stories") where the reader/player does not simply solve a mystery through reading the story. The reader/player is a part of the story because each question, decision or action alters the story—even to the extent of potential murder of or by the reader/player. Infocom also "publishes" (the quotation marks are necessary now, but probably won't be in two years) an adventure fantasy series known as the Zork Trilogy. In 1982 about 100,000 copies of five different "participa-stories" in the Zork Trilogy were sold. The genre will develop as data-storage and programming techniques develop and the relatively simple vocabulary, grammar, and syntax should become much more sophisticated. (Edward Rothstein, "Reading and Writing," New York Times Book Review, May 8, 1983) The fantasy in such developments is not in the fact that these programs exist, but in the potential for teaching literature and composition. Mark Twain would definitely approve as, I imagine, would Edgar Allen Poe.

Turning from this scene, which you may find bizarre or marvelous, depending on how honest you are in acknowledging the influence of technology on your life, let us look at the possibilities and the actualities of computers and composition.

Word processing and the word processing capabilities of microcomputers are changing the way in which we perceive and perform the writing process. In the April, 1983, issue of Personal Computing, 74 different word processing packages are analyzed comparatively, with 39 different editing features (features for the input and correction of text) being compared and 40 different formatting features (features for the output and printing of text) being analyzed. Beyond the machines and the programs and the materials lies the

question of how can word processing help us in writing and in teaching writing.

If we truly see revision as being that stage of the writing process which ". . . turns inspiration into creation" and truly believe that ". . . writing is rewriting. . .," (Donald Murray, A Writer Teaches Writing, Houghton Mifflin, 1968), then it is in revision that the microcomputer offers the most to us. In his speech to the Conference on English Education luncheon in Seattle in April, Geoffrey Summerfield reminded us: "When we read, we're also writing. When we write, we're also reading." If revision is a matter of erasing, scratching, cutting, pasting, redoing, recasting, moving and debugging our text, then the word processsing approach offers us the luxury of time to truly revise our text. Nearly all comments by writers who actively use word processors as their writing tool indicate that the great advantage word processing offers is one of time. Some estimates are that one can save as much as 50% of writing time by using a word processing approach. Beyond this most important consideration is that one can start to see revision as part of the process of adopting prose from the demands and needs of the writer to those of the reader. Alvin Toffler started using a word processor when he was about one-third of the way through The Third Wave. He found that by being able to rework materials and not having to retype each time, he ". . . comes closer to seeing them (the words) as a reader while still working as a writer." (Courter, "Word Machines for Word People," Publisher's Weekly, February 13, 1981) Seeing your words as a reader while still working as a writer has to be a major goal of all of us who teach writing. No English teacher worth her salary is unaware of the difficulties young writers have with revision. (And can anyone appreciate as fully as an English teacher the irony of the machine telling you, "?Syntax error"?)

Again, I would point out to those who deny the importance of the tools used by writers that The Adventures of Huckleberry Finn was the first novel in American literature to be produced at a typewriter. Had Mark Twain been a Luddite, his impact on American literature would be much different.

In "The Computer Kids and Composition," Valerie Arms lets students say what it is like to compose at a computer. "Ever since I started using the word processor, I have become more and more confident of my writing ability. Anxiety over having an assignment finished on time, and concern over whether or not I could have done a better job on an assignment are virtually gone. Ease of change, revision, and correction allow me to try almost any combination of styles in my writing without having to worry about wasting too much time." The computer " . . . allows no room for laziness because of the ability to correct and improve my writing style at the push of a few buttons." And "I like the spell function, the ease of re-paragraphing, everything the computer has to offer. It almost makes writing fun!"

There are experimental and developmental programs in the use of computers to teach writing going on all over the world at all levels of education. The October, 1983, issue of College Composition and Communication will have a cluster of articles on computers and composition, including an extensive bibliography by Helen Schwartz. The "beginner's guide" bibliography which accompanies this article is an indication of some of the materials which are available. If cyberphobia still constricts your veins, look particularly at the articles by Bradley, Jaycox, Nold and H. Schwartz.

Some of the programs developing new ideas and new materials, as well as doing research, are like the one at Colorado State University, where Kate Kieffer and Charles Smith are refining the Writer's Workbench program from Bell Labs. Jack Jobst at Michigan Tech has developed an interesting program for grading and recording in teaching composition. Steve Marcus of the University of California at Santa Barbara has available an unusual and exciting idea called "Compupoem." The Minnesota Educational Computing Consortium is a state-wide program that has developed many excellent programs for use in teaching writing. In Britain, Dan Chandler has recently edited Exploring English with Microcomputers (H. Cave and Co., Ltd., 1983). Some of the most exciting experimental work is being done at the University of Minnesota by Lillian Bridwell and Donald Ross, who are investigating the effects of word processing on experienced writers as well as doing hardware evaluation, curricular assessment, and student evaluation of courses taught via word processing. In addition, Bridwell and Ross are doing experimental work in teaching writing across the curriculum through the use of the computer. The combination of word processing approaches with writing across the curriculum programs seems especially fruitful, since our colleagues in disciplines outside English are far ahead of us in the research applications of the computer. Our introduction of computers into writing across the curriculum programs will be an important development in the next few years.

This brief listing of some of the programs being developed around the country is intended as an example of what is being done and is only a brief indication of the many programs now being developed. Special applications of word processing approaches to special populations, such as the designing of special sections of our freshman composition courses for dyslexic students at Southern Illinois University at Carbondale next year, will become even more commonplace.

I cannot end this piece without warning as to the potential ill effects of the use of computers in teaching English and of the impact of computers on education in general. My concern here is not the same as Neil Postman's in "The Las Vegasizing of America," where he presents an argument on the fundamental changes that electricity has made in public communication. Rather, my concern, perhaps an extension of cyberphobia, is the potential of developing an entire generation which is divided between those who have grown in reasoning abilities and awareness through the use of the computer and those who will be left behind because of their lack of training and lack of use of computers. We are already beginning to see some of the potential problems when we realize, as the National Center for Educational Statistics pointed out in 1982, the use of microcomputers in public schools tripled between fall of 1980 and spring of 1982. What they failed to point out is that 80% of the country's 2,000 largest and richest public high schools have at least one micro available to students while 60% of the 2,000 poorest schools have none. As Herbert Lobsenz, President of Market Data Retrieval Inc, the company which did this national survey, says: "If computers are the wave of the future, a lot of America is being washed out." (Time, November 12, 1982)

Those being washed out will most likely be those who are washed out in other ways. Beyond this economic wave, which has obvious racial overtones, let us look carefully at the sexist implications of our present fascination with computers. Those of us who work with computers and composition at the college level are not aware of any sexual differences in interest in computers.

None of us can ignore the fact that "the culture of computing is overwhelmingly male. With few exceptions, men design the video games, write the software, sell the machines and teach the courses." (Psychology Today, March, 1983) Elementary school usage would seem to be evenly split between boys and girls, but when puberty strikes, a vast difference is seen. Step into any video game arcade and you'll see part of the proof. Go into any junior high school computer class and note the difference in male and female enrollment and participation. Perhaps computer anxiety can be seen as an extension of math anxiety. Perhaps not.

These potential economic, social, racial and sexual differences that are starting to surface as part of the computer culture should be of major concern to us as humanists. It is as humanists that we can bring to bear our concerns. It is as humanists that we can see that the full potential for the use of the microcomputer in teaching is explored and developed.

In 1968, the reference year with which I started this paper, Richard Brautigan, in The Pill vs. the Springhill Mine Disaster (Delta), had a marvelous poem titled "All Watched Over by Machines of Loving Grace." Brautigan tells us of ". . . a cybernetic meadow
where mammals and computers
live together in mutually
programming harmony. . ."

and of

". . . a cybernetic forest
where deer stroll peacefully
past computers."

Let us, as English teachers and as humanists, be

". . . returned to our mammal
brothers and sisters,
and all watched over
by machines of loving grace."

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PACKWORD

Computer Assistance in the Semiotics of Reading
A Critical Speculation

by
Raymond E. Fitch

How is a poem like a computer? Of course they are unlike in most respects, but a poem is probably as much like a computer as it is like an organism, or a psyche, or a self, the processors with which it is usually compared; for the poem, like the computer, is an "information handler"; it can be viewed as a compact device for storing and processing information. Therefore Yuri Lotman reminds us that the work of art "is the most economical, compact method for storing and transmitting information"; not only can the literary work "concentrate a tremendous amount of information into the 'area' of a very small text," it can also transmit "different information to different readers in proportion to each one's comprehension."[1] More abstractly, Julia Kristeva defines the text as "a translinguistic apparatus which redistributes the order of the language by putting a communicative utterance, aiming to inform directly, in relation with different utterances, anterior to or synchronic with it."[2]

The work of these and other semiologists allows us to see the poem, the artistic text, as a device that is equipped to store and process information by means of its internal programs or invariant systems of codes, such as the conventions of a particular genre or school, and other more specialized circuits. But the text is also open for use, and when the reader operates it he does not receive information passively; if he utilizes the text's potential he computes with it, in a way; and his input consists of codes he has internalized, especially from other texts. These codes are themselves often formed into invariant cultural or critical systems that function as programs. Meaning occurs when the poem appears to "work"; that is, when the reader is able to communicate with the text by means of the system of codes--the "software"--through which he reads, and is read by, the poem. The codes built into the poem, its "firmware," are linked through the reader's consciousness to external codes--the plurality of other texts the reader knows--to form a powerful and potentially gratifying communicative network. "Literature," Roland Barthes has written, "is never anything but a single text: the one text is not an (inductive) access to a Model, but entrance to a network with a thousand entrances."[3] The poem, like the computer, does not supply answers out of itself; it simply makes connections: but it will only make them, with anything like its full potential, for a competent operator.

Robert Scholes has recently reminded us that even a brief literary text like W.S. Merwin's

requires an operator who has already encoded much information about the poem's relation to other texts. The conventions of the elegy, the anti-elegy, and the minimal poem are, in our analogy, programs by means of which the competent reader-operator can communicate with this poem. As Scholes observes, "the 'words on the page' do not constitute a poetic 'work,' complete and self-sufficient, but a 'text,' a sketch or outline that must be completed by the active participation of a reader equipped with the right sort of information."[4] Every teacher knows that the poem, like the computer, cannot make better connections than its reader-operator can propose or comprehend: garbage in; garbage out. This is why teaching in literature is concerned with the development of what Jonathan Culler has called "literary competence"[5] or knowledge, we could say, of the norms, conventions, and other systems of codes that can program literary texts, like Merwin's Elegy.

I have persisted in this analogy between the poem and the computer because I wanted to bring the ideas of reading and computing as close together as I can in order to ignite this particular line of questioning: how can the computer assist the reader reading, as opposed to researching, artistic texts? For an answer it is reasonable to turn to the more comprehensive guidebooks to computer applications in the humanities or in literature. But when we look into such comparatively recent and valuable surveys as those by Susan Hockey[6] and R.L. Oakman[7] we find that the preponderant emphasis is, appropriately, on applications to highly specialized "research," not to reading. The annual bibliographies reveal a similar weighting of interest: computer methods, often with software packages, have been developed for generating concordances, indices, dictionaries, bibliographies; for collating texts, analyzing styles, and identifying authorship. But these researches, despite their value, have little direct relation to ordinary creative reading. To assist the literary reader so engaged the computer must process coded "literary data" of a more freely exploratory, less specialized kind. It must be able to suspend the coded reading in its memory so that the student-reader can re-enter it, play with it, or feed the readings of others to it; for the reading is always, we should hope, in process; it is only written down when it must become itself a work--a paper, say, for the teacher's perusal.

A pleasant fantasy this videoread, but how would our reader actually proceed to encode a given text so the machine could read and rearrange it? I believe the reader could employ a system much like that devised by Barthes in S/Z (1970), his famous semiotic reading of Balzac's novella Sarrasine. Of course the reader would not be expected to provide anything like Barthes' brilliant commentary (he might not write anything), and he may bring quite other codes than Barthes employs, for these will be drawn from his own experience ("This 'I' which approaches the text is already itself a plurality of other texts...."[8]); however, the computer-assisted reader, though lacking Barthes' skills, could perform some operations with his own Barthesian codes that Barthes, without the computer and committed to writing, was unable to perform.

The kind of semiotic reading I am imagining here is essentially an in-

dexing and cross-indexing process in which the student invents the categories, the codes, out of his experience with the text in hand and his sense of its relation to other texts. I suppose it could be programmed by modifying an indexing package. Again, it would not be a research procedure; there would be no empirical verification. It would be a way of reading, of co-creating with the text, of exploring, through one's own input, the text's capacity to mean. Finally, this procedure would be based on the assumption that awareness of the codes that make literary communication possible is of greater value at present in literary pedagogy than additions to the sum of "final" interpretations.

Barthes, who wrote of his procedure in S/Z as being "the step-by-step method...never anything but the decomposition (in the cinematographic sense) of the work of reading: a slow motion, so to speak,"[9] breaks up his text--in a way which he admits is "arbitrary in the extreme"--into brief linear segments he calls lexias. He requires only that "each lexia should have at least three or four meanings to be enumerated";[10] so his lexias range in length from single words to sequences of several sentences. They are the reader's primary response to the text as he perceives meaning units there, or encodable groups of connotations. Barthes' lexias are numbered in sequence through the text; though he divided Sarrasine into 561 lexias, we understand that another reader might arrive at a quite different segmentation of the text. Furthermore, our reader would feed his lexias, like items in an index, into the computer for later classification under codes.

Barthes proceeded to annotate each lexia in turn according to the codes of connotation they awaken in the reader from the texts he (Barthes) has already read; the codes are "so many fragments of something that has been already read, seen, done, experienced; the code is the wake of that already."[11] Indeed, the reader as such is constituted of codes. The codes process the lexias through the reader's textual experience; to sort the lexias into codes "is to give them a place in the groupings established by one's experience of other texts and of discourse about the world."[12] Barthes annotated his lexias in terms of five codes: (1) references to action, (2) enigmas or mysteries in the work, (3) references to traditional knowledge or wisdom, (4) thematic connotations, and (5) symbols. In his inimitable annotations and interspersed commentaries Barthes does so much more than classify lexias into these codes, but this is his essential method. Our reader can never hope to reproduce his touch; but with a touch of his computer he could do what Barthes could not do in writing: he could create the sense of a vital web in text, processing the codings in many different dimensions, retrieving, for instance, in a moment, the full array of lexias within any given code in that text. In so doing, by active reweaving of the text, he might better reproduce Barthe's view of the modern concept of textuality, which, he wrote, "turns away from the text as veil and tries to perceive the fabric in its texture, in the interlacing of codes, formulae and signifiers, in the midst of which the subject places himself and is undone, like a spider that comes to dissolve itself into its own web."[13]

NOTES

[1]Yuri Lotman, The Structure of the Artistic Text, tr. Gail Lenhoff and Ronald Vroon, Michigan Slavic Contributions, no. 7 (Ann Arbor: Department of Slavic Languages and Literature, University of Michigan, 1977), p. 23.

[2]Julia Kristeva, LeTexte du roman. (The Hague: Mouton, 1970), p. 12.

[3]Roland Barthes, S/Z, tr. Richard Miller (New York: Hill and Wang, 1974), p. 12.

[4]Robert Scholes, Semiotics and Interpretation (New Haven and London: Yale University Press, 1982), p. 38.

[5]Jonathan Culler, Structuralist Poetics (Ithaca, N.Y.: Cornell University Press, 1975), pp. 113-30.

[6]Susan Hockey, A Guide to Computer Applications in the Humanities (Baltimore: The Johns Hopkins University Press, 1980).

[7]R.L. Oakman, Computer Methods for Literary Research (Columbia, S.C.: The University of South Carolina Press, 1980).

[8]Barthes, S/Z, p. 10.

[9]Ibid., p.12.

[10]Ibid., pp. 13-14.

[11]Ibid., p. 20.

[12]Culler, Structuralist Poetics, p. 202.

[13]Roland Barthes, "Theory of the Text," tr. from Encyclopaedia Universalis by Ian McLeod, quoted in Robert Young, Untying the Text: A Post-Structuralist Reader (Boston, London and Henley: Routledge & Kegan Paul, 1981), p. 39.

NOTES ON COMPUTER LITERACY

by
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Have you ever noticed that people who want to champion a cause often link onto the word "literacy"--as in visual literacy, global literacy, scientific literacy, computer literacy, and what-have-you-literacy? The device is raw propaganda, I believe, and it does no service to reading and writing (which must now, it seems, be redundantly called "print literacy"). Jean Greenlaw (1976) and Morrow and Suid (1974) have asked hard questions about slippery verbalizations like "visual literacy." Similarly, we must ask What do computers really have to do with literacy?

Computers have a great deal to do with mathematics and science: programs like LOGO (Papert, 1980) show promise for teaching geometry and physics in new ways. But outside of word processing, certain experimental composition teaching techniques, and some interesting forays into reading based on schema theory (Bradley, 1982; Schank, 1982)--a slim part of the computer movement in education--there is little in the movement that advanced traditional literacy.

This paucity exists despite a theoretically wide range of approaches to education by computer. Software materials can embrace problem-solving, simulations, tutorials, and drill and practice. Bork (1982) holds high hopes for inexpensive software that is "nontrivial." But educators constantly complain that most software materials currently on the market are extremely poor; and research in computer-assisted instruction, including the large-scale systems like PLATO and TICCIT, is not impressive (Bell, 1980; Grayson, 1981).

The medium itself has limitations for reading that are seldom taken into account by computer enthusiasts. For physiological and psychological reasons, a 40-character, 34-line television monitor is a poor medium for intensive reading. True, a user can gain quick access to various parts of a lengthy text. But the fact is that complex texts--those requiring concentrated attention and high-level synthetic reasoning--are scarcely found either in commercial software packages or in external database resources. The computer is a medium well suited to information aggregates--stock reports, recipe collections, short news items, and the like--not to extended prose fiction or analytical essays.

Computer jargon falsely suggests the expansion of verbal horizons. The term "languages" is applied to programming procedures like BASIC, PASCAL, and FORTRAN. But the term must be understood analogically here, as when we speak of the "language" of music, painting, or mathematics (Suhor, in press). Learn-

ing BASIC, in fact, yields far less insight into verbal language than does studying the aesthetics of, say, jazz improvisation (Hodeir, 1979) or pictorial expression (Goodman, 1968). Presumably, hobbyists can learn simple computer languages and create their own programs--and there might be considerable educational value in doing so--but there is no evidence that developing homemade programs has beneficial effects on literacy skills.

I don't expect that reasoned argumentation will drive a term like "computer literacy" out of use. But a more critical attitude towards any catchphrase will help us to resist uncritical applications of the phrase--and commercial snowjobs as well. Too many educational decision-makers have been mesmerized by extravagant claims advanced by industrial representatives who are promoting the computer movement in education. We need not add the major of the word "literacy" to the excesses of that movement.

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ENGLISH AND LANGUAGE EDUCATION COURSEWARE INVENTORY

by
Lester S. Golub

The rationale for developing a valid and reliable instrument for selecting courseware for the teaching of English has become apparent as commercial publishers and independent teachers realize that there is a market for courseware in the schools. As these materials appear, teachers of English need a courseware inventory that is: 1) specific to the content of English and 2) derived in an interactive and participatory fashion.

Teachers of English have a task to do in the schools which is different from that of the teachers of science, mathematics, and social studies. The role of the teacher of English at the primary and intermediate levels is to teach the communication skills of listening, speaking, reading, and writing; all four skills with understanding. The role of the teacher of English at the advanced levels is to teach literature, language structure, composition, and rhetoric; all four components with comprehension. The instrument for the selection of courseware needed to teach these areas of emphasis should reflect the task of the teacher and the corresponding objectives for the student.

At this writing, courseware in English is inadequate to support the variety of needs of students and teachers. Most of this English teaching microcomputer courseware consists of spelling tutorials, punctuation drills, grammar activities, testing word attack skills, and vocabulary skills.

One more fact that English teachers ... to know in selecting and using courseware is that most English teaching ...crocomputer courseware is in some phase of development; that is, teachers and their pupils are being involved in the formative evaluation of these materials. English teachers should know which developmental phase the program is in, and if they purchase the program at a fair market price, they should know whether or not the program has undergone summative evaluation procedures. The date of release and the numbered version of a program can be extremely important to teachers of English.

Criteria which the English teachers may use in selecting and purchasing courseware follows. The English teacher should be certain that the courseware:

1. Is free of technical and pedagogical errors.

2. Reflects current and valid English curriculum content as determined by scholars and practitioners in the field and meets curriculum goals of the school program.

3. Takes advantage of the unique capabilities of the classroom microcomputer which include teaching pupils to think in systematic, organized, and sequential modules of information, such as "top-down" ordering as provided by Logo.

4. Allows the pupil to use information provided by the computer as in the simulation of a story plot line or character development in literature.

5. Provides immediate, positive reinforcement for the pupil, diadic (two-way) communication between the pupil and the microcomputer, and allows the pupil to understand the reasons for wrong answers.

6. Includes diagnostic-prescriptive and branching features so that pupil progresses in a systematic way in the learning of English concepts.

7. Allows for teacher modification of the program so that the teacher can provide more sentence, more grammar structures, further vocabulary development, and editing activities as needed by individual pupils.

8. Provides for supplemental written copy and activity materials so that skills acquired for use on the microcomputer can be applied toward the more traditional uses of English such as outlining, paper and pen composition writing, and the analysis of literature.

The subject matter of English needs a specific, microcomputer courseware selection instrument. The following "English and Language Microcomputer Courseware Inventory" can assist you in assessing microcomputer courseware for the English curriculum.

ENGLISH AND LANGUAGE EDUCATION MICROCOMPUTER
COURSEWARE INVENTORY

Program Title: _____

Producer

Name: _____

Address: _____

_____

Phone No.: _____

Author/Developer

Name: _____

Address: _____

_____

Phone No.: _____

Microcomputer Equipment Needed

Microcomputer Name: _____

Videodisc: _____

Grade Level

Primary, K-3: _____

Intermediate, 4-6: _____

Videotape: _____

Disc-driven: _____

Tape-driven: _____

Audiocassette: _____

Other: _____

Junior High, 7-8: _____

High School, I, 9-10: _____

High School, II, 11-12: _____

College: _____

Audience

Rural: _____

Suburban: _____

Urban/Inner City: _____

Hispanic Bilingual: _____

East Asian Bilingual: _____

Handicapped: (specify) _____

Other Minority: (specify)____

Teacher Preparation Needs

None: _____

Computer Literate: _____

Programming: _____

Inservice: _____

Other: (specify)_____

SELECTION CRITERIA

Directions: Place an X at your rating: 5 = Excellent (EX), 4 = Very Good (VG), 3 = Satisfactory (S), 2 = Poor (P), and 1 = Little or No Evidence (NE). Please answer all questions.

1. Courseware reflects current and valid English and language education curriculum content.

	NE 1	P 2	S 3	VG 4	EX 5
1. Description of English/language content validation available.	—	—	—	—	—
2. English/language goals and objectives clearly stated for teacher and pupil	—	—	—	—	—
3. Courseware teaches to stated goals and objective.	—	—	—	—	—
4. Courseware can be used to enhance the school English/language curriculum objectives or guide.	—	—	—	—	—

5. Graphics supplement and enhance English/language learning. ___ ___ ___ ___ ___

6. Explanations and directions to students are written in correct, clear, and concise language. ___ ___ ___ ___ ___

7. English/language activities are written at pupils' reading, interest, and cognitive levels. ___ ___ ___ ___ ___

8. Learner and teacher control speed and difficulty level of concept and skill attainment and goal setting in English and language learning. ___ ___ ___ ___ ___

9. Listening, speaking, reading, and writing skills are incorporated in the learning activities of the program. ___ ___ ___ ___ ___

10. Reading skills and text editing activities in the program. ___ ___ ___ ___ ___

AVERAGE FOR SECTION I _____

II. Courseware uses unique capabilities of the microcomputer.

	NE 1	P 2	S 3	VG 4	EX 5
1. Program provides language programming skills or insights for pupil.	___	___	___	___	___
2. Program provides systematic top-down or bottom-up critical thinking strategies for pupils.	___	___	___	___	___
3. Modular thinking is taught pupils.	___	___	___	___	___
4. Pupils are provided or provide an English/language data base from which they can generalize or solve problems.	___	___	___	___	___
5. Pupils can simulate experiences for literature, language, and composition purposes.	___	___	___	___	___
6. Drill and tutorial practices are relative to the content and goals of the school or course curriculum.	___	___	___	___	___
7. Pupils and teachers are provided with a pupil progress management system.	___	___	___	___	___

8. Pupil can generate or transform sentences. ___ ___ ___ ___ ___

AVERAGE FOR SECTION II _____

III. Courseware provides immediate and positive reinforcement for the pupil.

	NE 1	P 2	S 3	VG 4	EX 5
1. Program addresses pupil by name.	___	___	___	___	___
2. Pupil can provide the computer with coherent information.	___	___	___	___	___
3. Pupil is politely told when responses are correct or incorrect.	___	___	___	___	___
4. Pupil can leave an item after two or three tries.	___	___	___	___	___
5. Pupil receives explanation for incorrect answer.	___	___	___	___	___
6. Unnecessary recoding is avoided when not necessary.	___	___	___	___	___
7. Pupil and the computer communicate as a unit of two.	___	___	___	___	___

AVERAGE FOR SECTION III _____

IV. Courseware provides diagnostic-prescriptive and branching strategies.

	NE 1	P 2	S 3	VG 4	EX 5
1. English/language pretests and posttests are provided.	___	___	___	___	___
2. Immediate feedback of results of tests and activities are provided.	___	___	___	___	___
3. Pupil can enter program at measured ability level.	___	___	___	___	___
4. Supplemental activites provided for pupils needing practice.	___	___	___	___	___
5. Pupils can abort program and go on to other English/language learning activities once criterion level is achieved.	___	___	___	___	___

6. Pupil and teacher are provided with an English/language management program. ___ ___ ___ ___ ___

7. Supplemental learning activities are suggested. ___ ___ ___ ___ ___

AVERAGE FOR SECTION IV _____

V. Courseware provides for teacher modification of program.

	NE 1	P 2	S 3	VG 4	EX 5
1. Listing of courseware program available to teacher.	___	___	___	___	___
2. Teachers use of listing or other source for programming additional sentences, vocabulary, reading and literature questions.	___	___	___	___	___
3. Using listing, teacher can program own activities.	___	___	___	___	___
4. Using listing, pupils can program activities for other pupils.	___	___	___	___	___
5. The programmed structure of a simulation or a drill and practice can accomodate a number of data bases.	___	___	___	___	___

AVERAGE FOR SECTION V _____

VI. Courseware provides supplemental support materials and activities.

	NE 1	P 2	S 3	VG 4	EX 5
1. Program documentation is available.	___	___	___	___	___
2. Pupils are given ways of applying spelling, grammar, vocabulary, reading and literature skills practiced in the computer to their textbooks.	___	___	___	___	___
3. Composition and writing activities are conducted on the computer (word processing and text editing) as well as with paper and pen.	___	___	___	___	___
4. More than one pupil can work together at one computer for word processing/editing procedures.	___	___	___	___	___

5. Pupils are encouraged to use spelling, grammar, vocabulary, rhetoric skills in word processing and text editing of compositions. ___ ___ ___ ___ ___

AVERAGE FOR SECTION VI _____

- -

SUMMARY SHEET
Averages

I. Current and valid English/language curriculum and scholarship. _____

II. Use of unique capabilities of microcomputers. _____

III. Immediate and positive reinforcement. _____

IV. Diagnostic-prescriptive, branching strategies. _____

V. Teacher/pupil modification. _____

VI. Support materials and activities. _____

TOTAL _____

AVERAGE _____

USER COMMENTS

Student: _____

_____

_____

Teacher: _____

_____

_____

Reviewer

Name: _____

Address _____

_____

Phone No.: _____

Date: _____

The Pennsylvania State University

THE WORD PROCESSOR IN THE ELEMENTARY CLASSROOM

by
Marlowe Ediger

In many ways, the word processor is challenging the worth of the traditional typewriter in the curriculum. With the utilization of microcomputers in the school/class setting, even young learners are increasingly mastering the use of the keys on the keyboard. The keys on the computer keyboard are in the same sequential positions as is true of keys on a typewriter. A few additional keys can be present in selected keyboards on computers.

Six year old pupils on the first grade level can generally press the correct keys in responding to computer assisted instruction items (CAI) emphasizing drill and practice. Thus, on a computer screen, the involved pupil may see the basic number pair 5 + 2 = __. To be correct in responding, the learner needs to press the "7' key. On the screen, a smiley face emphasizes reinforcement for answering correctly what 5 + 2 equals. If a pupil responded incorrectly, he/she may see on the screen "try again." A second attempt is made by the pupil to answer correctly 5 + 2 = ___. If the response is incorrect again, the correct answer is now shown on the screen. This learner, as well as the pupil who responded correctly initially, is ready for drill and practice on a different ordered number pair. Thus, through responding to items on the screen in any curriculum area, the learner becomes increasingly proficient in using the keyboard on a computer and these skills are the same/similar as those demanded in traditional typing. The traditional typewriter, however, is easier to move and is more mobile as compared to the word processor.

Uses of the Word Processor

Already on the early primary grades, pupils with teacher assistance may make use of the word processor. For example, if young learners have had an experience such as viewing a set of meaningful slides pertaining to an excursion, they may present the resulting ideas, individually or in small groups, to the teacher who in return uses the keyboard to type the content. Pupils may then see talk encoded into words and sentences. What learners present in ideas can be seen on the screen of the word processor. Modifications, insertions, and corrections may be made by the teacher without typing anew the experiences presented by learners.

Pupils with teacher guidance can read the typed content seen on the monitor. The teacher points to words and phrases as the subject matter is being read by learners. Thus, the experience chart method is being emphasized in teaching beginning reading. An experience chart approach emphasizes the following:

1. learners have personal experiences which provide content for reading instruction.

2. content is provided by pupils based on what has been experienced.

3. learners can see their ideas in print.

4. guided practice is provided in having learners read the sequential ideas.

Sequential Experiences and the Word Processor

The primary grades may well provide foundational learnings in utilizing the word processor. Sequentially, as readiness permits. students need to achieve competency in using the word processor to write

1. business and friendly letters

2. announcements and thank you notes.

3. notices of sympathy.

4. poems, plays, and stories.

5. invitations.

The content for each of the above named purposes can be typed using the keyboard on the word processor. The encoded ideas appear on the screen. The mechanics of writing (spelling, punctuation, capitalization, usage, and indentation) can be quickly modified in order to develop more accurate and meaningful communication. Insertions, deletions, and rearrangement of subject matter is readily possible without retyping an entire page (or pages). Writing experiences sequentially developed by learners, using the word processor, become

1. more enjoyable as compared to the utilization of more traditional means, such as paper and pencil rough drafts and the typewriter. Novelty, newness is involved in learning.

2. the routine and the mundane are being minimized. Rewriting or retyping a written product is no longer necessary. The word processor can take care of repetitious correcting of errors. The operator needs to possess needed skills in instructing the computer to make necessary modifications.

In Conclusion

Rapid technological changes are occuring in society. The computerized word processor has the potential to provide learners with quality experiences to improve the writing curriculum. As time goes on, an increased number of word processors, no doubt, will be found in classrooms. Learners, hopefully, will do more writing as compared to previous times. Increased skills in writing with a greater number of purposes involved should be an important end result. Interest in writing must also be increasingly in evidence as revising, modifying, and editing become less grievious. Students then may achieve more optimally in understandings, skills, and attitudinal goals.

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ENGLISH TEACHERS CAN CREATE THEIR OWN INSTRUCTIONAL SOFTWARE

by
James Christopher Davis

It is time for English teachers to put aside their fears about the computer. It is not only a tool for the mathematically brilliant. I am a senior in college preparing to teach English without a very strong math background; and after three courses in computer programming I have developed the skills to create simple but productive programs that could be used to help my future students learn. In fact, I am certain that anyone who spends some time learning a computer language could create their own simple instructional "software." These computer programs could be in the form of games, motivating the student with interactive learning and giving the student "hands-on" experience with a computer system. For the early grades, for example, games could be designed for alphabet recognition, letter combining, and word combining. Games designed for later grades could be grammar drilling, sentence combining, and paragraph evaluation. Programs can also be designed to present information to students and drill them on it.

There is a great deal of controversy about the effectiveness of the drill and practice form of instruction, and about multiple choice tests in general; but multiple choice questions are easy to program, and Basic is an easy computer language to use. This is how a single multiple choice question might look in Basic:

```
10 REM This is an example of how a multiple choice question would be
20 REM programmed.
30 REM
40 REM
50 PRINT "This is a multiple choice question."
60 PRINT "Type the letter next to the correct answer, and then type return"
70 PRINT
80 PRINT
90 PRINT
100 PRINT "Who wrote Romeo and Juliet?"
110 PRINT "a. Donne"
120 PRINT "b. Johnson"
130 PRINT "c. Shakespeare"
140 PRINT "d. Shaw"
150 INPUT A$
160 IF A$="C" THEN GOTO 190
170 PRINT "Sorry, try again."
180 GOTO 100
190 "You got the right answer!"
```

The number at the beginning of each line indicates the order the statements will be executed by the computer when the program is run. I have used increments of ten in case I want to add anything later. REM, the remark statement, is meant for humans; the computer just ignores them. Programs are documented and explained using remarks. The PRINT statement sends information to the screen and/or the printer. In line 150 of the program there is an INPUT statement. It expects data from the keyboard followed by a return. The A$ that follows the INPUT is a string array variable, which expects characters for its value. If the input is a word then the string array would need to be declared with a DIM statement. If I had wanted the answers to be numbered 1, 2, 3, and 4, then I would have used a regular variable for the input; the dollar-sign after the A would simply have been dropped. In line 160 I use an if-then construct to test for the correct answer. If the answer is correct, the GOTO statement sends the program to line 190 where the affirmative line is printed. If A$ is not read as C, then line 170, the negative line, is printed; and the GOTO statement in line 180 sends the program to line 100, and the question is asked again.

When the program is run the output on the screen would look like this:

```
This is a multiple choice question.
Type the letter next to the correct
answer, and then type return.

Who wrote Romeo and Juliet?
a. Donne
b. Johnson
c. Shakespeare
d. Shaw
? (at this point the computer waits for a response.)
C (this response produces the following output.)
You got the right answer!
```

This program could be expanded by adding more questions, tallying how many attempts the student makes, and keeping track of the student's performance. Using simple programming techniques the teacher can create as complex a testing format as desired. Inductive or deductive teaching methods could be used. One is certainly not limited to multiple choice questions with a single answer. Students could actively create answers. If wrong answers that are almost right are given by the student, different responses could be returned like, "Almost correct, but your spelling is wrong. Consult a dictionary and try again." The method of programmed instruction could be linear or branching.

Following is an example of what a simple branching problem might look like in Basic, and what the output of the program would be. The question format is fill-in-the-blank.

```
10 REM This is an example of how a fill-in-the-blank question would
20 REM be programmed.
30 REM
```

```
40 DIM A$(20)
50 PRINT "This is a fill-in-the-blank question."
60 PRINT "Type the answer, and then type return."
70 PRINT
80 PRINT
90 PRINT "Who wrote Romeo and Juliet?"
95 PRINT "Just give the last name."
100 INPUT A$
110 If A$="Shakespeare" THEN GOTO 190
120 If A$="Shakespeare" THEN GOTO 160
130 If A$="Shakespere" THEN GOTO 160
140 PRINT "Sorry try again."
150 GOTO 70
160 PRINT "Almost correct, but you have used a"
170 PRINT "variant spelling.  Try again."
180 GOTO 70
190 PRINT "You got the right answer!"
```

```
This is a fill-in-the-blank question.
Type the answer, and then type return.

Who wrote Romeo and Juliet?
?
Shakerspear(student's response)
Sorry, try again.

Who wrote Romeo and Juliet?
?
Shakespere (student's response)
Almost correct, but you have used a
variant spelling.  Try again.

Who wrote Romeo and Juliet?
?
Shakespeare
You got the right answer!
```

An argument could be raised that all of this can be done using paper, but paper cannot give a student a second chance to answer questions, immediately correct or alter a wrong answer--paper cannot interact with the student.

Other problems: just as some students hate tests, some students will hate working on the computer; some students who do not get the correct answer the first time may get discouraged; some may even fear it. But the computer is simply another technological tool; and some may be inspired by it.

What does the growing interest in using the computer in the classroom mean for the person considering teaching English in the future? The teacher

of the future must be aware of the applications of the computer in teaching, must be familiar with the operation of computer "hardware" and "software," and should develop the ability to "program" in computer languages--this is especially true for those who already own computers, and those who will almost certainly be working with them. This position may sound a bit extreme, but there is every indication that most schools use computers for either administrative purposes, "computer aided instruction," or "computer managed instruction," and that this use is growing. The teacher of English, if at all interested, and who has computers available for use, should explore the possibilities of programming.

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COMPUTERS IN THE TEACHING OF ENGLISH
(WHAT IS HAPPENING IN SOUTHWESTERN OHIO)

by
MARK A. KRABBE, PH.D.

During the past two years six articles devoted to teaching English with the computer have appeared in the English Journal. In the September, 1981, issue Kara Gae Wilson sets forth her ideas regarding the English teacher's role in promoting computer literacy. Toward the end of her article she states:

> "A computer literate individual is in the habit of thinking analytically and welcomes the opportunity to solve problems, perceived not as problems but as challenges. It is the English teacher, more than any other, who is already well qualified to provide the necessary skills to build that habit of thought and to give direction to its application."[1]

A year later Brian D. Monahan describes how he introduced his students to the process of revision by using a word processing package on the TRS-80's in his school. The students wrote in class and then used the computer for revision. This procedure lasted for a semester and Monahan observed that they made more revisions and at a higher level when using the word processor. He concludes that his experience convinced him "that teachers of English cannot and should not be left out of the technological revolution."[2]

The very next month Schullstrom and Mertz began an article on the implications for education of the computer revolution with the statement:

> "Silicon Age - Micro Revolution - Electric Surround - whatever it is called, it is no longer imminent, but present, and can no more be avoided or ignored by English teachers than could Gutenberg's moveable type."[3]

English teachers who attended the National Council of Teachers of English Annual Convention in Washington, D.C., last November could choose to attend eight different presentations on the computer and the teaching of English. Also at the convention teachers could participate in hands-on experiences at three different exhibits in the exhibit hall.

The OCTELA Annual Convention, held in Columbus this past March, had two presentations devoted to the use of the computer to teach English. Tommy Burkett from Dennison University reviewed the various uses the computer can be put to in teaching English. Mark Rollins of Ohio University reported on how his English Department was going about becoming acquainted with computers.

Now the entire Spring, 1983, issue of Focus is emphasizing computers in the Teaching of English.

All of this would seem to indicate that there are some who think the computer is a valuable instructional tool for teaching English. But are English teachers using the computer? I didn't think so. My supervision of student teachers has taken me into many high schools over the past few years, and I have never seen an English teacher using a computer to teach English.

In an effort to discover if the computer is being used in the teaching of English, I decided to survey forty-six high schools in Southwestern Ohio. These forty-six schools represented thirty-eight school districts and were selected on the basis that Miami University students are assigned student teaching placements in these schools. On March 9, 1983, a questionnaire was sent to the English department chair with a self-addressed, stamped envelope. By April 1, 1983, thirty-one completed questionnaires, or sixty-seven percent, had been returned. The results substantiated my feelings.

Question 1. Do the English teachers in your school have access to computers for the teaching of English?

	Number	Percentage
Yes	7	23%
No	24	77%

Comment

Of the twenty-four who said computers were not available, four, or seventeen percent, said that computers would be available for teaching English beginning with the 1983-84 school year.

Question 2. Where are the computers located?

	Number	Percentage
English Classroom	0	0%
Media Center	0	0%
Computer Lab	4	57%
Other	3	43%

Comment

The other schools have their computers located in an accounting room, a reading laboratory, or some storage room from which the computers can be moved to other locations.

Question 3. What kind of computers are available in your school for English teachers to use?

	Number	Percentage
Apple	5	56%
Texas Instrument	2	22%
Radio Shack	2	22%
Commodore Pet	0	0%
Other	0	0%

Question 4. Approximately how many English teachers use the computer on a regular basis?

Total Number 3

How many English teachers are in the English Department?

Total Number 71

Question 5. How frequently do the English teachers use the computer to teach English?

	Number	Percentage
Daily	0	0
Weekly	1	14%
Bi-weekly	0	0
Monthly	0	0
Seldom	6	86%

Question 6. For what kind of English instruction do the English teachers use the computers in your school?

	Number	Percentage
Teaching Spelling	1	11%
Teaching Vocabulary	5	56%
Teaching Grammar	1	11%
Teaching Composition	1	11%
Teaching Word Processing	0	0
Teaching Literature	0	0
Teaching Reading	1	11%
Other	0	0

Question 7. What kind of software do the English teachers use for the teaching of English?

	Number	Percentage
Commerical	5	71%
Teacher-made	2	29%
Other	0	0

Question 8. What reason do your teachers give for not using the computer to teach English?

	Number	Percentage
Computers not available	16	37%
Software not available	9	21%
Can't teach English with computer	1	2%
Don't know how to use computer	11	26%
None. All English teachers use computers	0	0
Other	6	14%

Question 9. Have the English teachers in your school been trained to use the computer in the classroom?

	Number	Percentage
Yes	6	19%
No	25	81%

If yes, what kind of training?

	Number	Percentage
College Course	1	11%
College Workstudy	1	11%
Inservice	5	56%
Self-instruction	2	22%
Other	0	0

Question 10. Do you think most of the English teachers in your school would like to use the computer to teach English?

	Number	Percentage
Yes	16	52%
No	8	26%
Don't know	7	22%

Question 11. Do you think the computer is a valuable instructional tool in the teaching of high school English?

	Number	Percentage
Yes	16	52%
No	2	6%
Don't know	13	42%

Question 12. Do you think college students preparing to be English teachers should be taught how to use the computer in the English classroom to teach English?

	Number	Percentage
Yes	29	94%
No	0	0
Don't know	2	6%

Conclusions

From the data collected it is evident that in most schools in Southwestern Ohio computers are not available for the teaching of English. Even where computers are available, very few teachers use them for teaching English. There does seem, however, to be an interest on the part of many English teachers to use the computer. More than fifty percent of the respondents noted that they thought most of the English teachers in their schools would like to use the computer to teach English. Supporting this idea is the fact that more than half of the respondents think that the computer is a valuable instructional tool and an overwhelming ninety-four percent think college students preparing

to be English teachers should be taught how to use the computer in the English classroom to teach English.

In summary it can be stated that presently very little is going on with computers to teach English in Southwestern Ohio. It does appear, however, that beginning next school year more schools and more English teachers will begin using the computer to teach English.

Footnotes

[1]Kara Gae Wilson, "English Teachers: Keys to Computer Literacy," English Journal, Vol. 70, No. 5, September, 1981. p. 52.

[2]Brian D. Monahan, "Computing and Revising, "English Journal, Vol. 71, No. 7, November, 1982, p. 94.

[3]Faith Z. Schullstrom and Maia Pank Mertz, "The Computer Revolution: Implications for Education," English Journal, Vol. 71, No. 8, December, 1982, p. 60.

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RESOURCES ON COMPUTER USE IN ENGLISH INSTRUCTION

by
Thomas Mulder

One of those celebrated few who still doesn't know the difference between a byte and a bit, I determined to delve into computer literature to flesh out just what this mechanism-mania has to offer my more humanistic field, English education. And now, although I still cannot speak its jargon, since having read whatever pertinent works I could get hold of, I am convinced of quite a number of productive uses to which the computer can be put in an English language arts class. By no means an all-inclusive list of available resources--there is simply too much out there--this article is rather an attempt to outline a comprehensive overview of what has been written about computer--primarily microcomputer--use in English instruction, citing materials that I found relatively easily available, therefore, I presume, readily available to other English teachers.

Each of the articles I read falls more or less conveniently into one of the following general divisions: Reviews of the Literature; Bibliographical Resources; Computer-Assisted Instruction in English--General References; Teaching Writing as a Process; and Spelling Instruction. (Although originally planning to include a section concerning reading instruction with computers, I decided not to, primarily because of spatial considerations, but also because this topic appears to be so well covered in other places.) Onto my six-part outline I have imposed something of an annotated-bibliographical-essay format, beginning with a brief bibliographical essay about computer-use in English instruction, then listing an annotated bibliography of references pertaining to the six topics outlined above.

The computer, before it can be used productively by English teachers, must be recognized for what it is, and for what it is not. It is not the threat that so many of us still seem to think it. Richard S. Powers outlines a number of misconceptions that English instructors have nurtured regarding classroom computers, exposing them one-by-one by explaining that computers will never squeeze teachers out of the classroom, are not necessarily dehumanizing to student-users, and don't require an exceptional aptitude in mathematics on the part of the teacher. Powers concludes, "We must all remember to see the computer not as a replacement of anything--certainly not of teachers or books--but as an additional tool to help us reach our goal of truly humanistic instruction" (Powers, 1981).

It is, when used as a humanistic tool, an extremely useful aid to

the teacher of English. A computer can be used to individualize instruction. By storing data about his students in its memory bank, an instructor has that data immediately accessible whenever he wishes to tailor instructional objectives to one or more of his students. With effective managing, he can keep anywhere from one to six students productively engaged with computer and computer-suggested activities. A computer can be used for drilling, exercise-practicing, and testing, and always gives instantaneous and accurate feedback. Moreover, a computer, because it is often a novel experience for students, and provides them active, "hands on," learning experiences, livens up English classroom activities (Powers, 1981). It has the added advantage of being able to rapidly edit text, and do literary and linguistic analysis. Furthermore, it has a somewhat extraneous editorial function in that it can only work with materials that are totally accurate (Bourque, 1983).

Yet, it does have its limitations. The first, obviously, is its price; this helpful device is available only to those who can afford its several hundred dollar per microcomputer unit price tag. Another is that it requires its users to have a working knowledge of its language. To make computers accessible to his students, an English teacher is going to have to teach them how to operate them, and this instruction demands time, time taken from an often already too time-starved English curriculum. Finally, especially as regarding the higher lever English classes, computer programs, ("software," say the books), are hard to come by. Because of this, English instructors typically have to design their own, a process that often takes months to complete (Bourque, 1983).

In spite of these limitations, almost all who have written about Computer-Assisted Instruction, ("CAI" in the journals' jargon), in English maintain the computer is a helpful addition to language arts instruction. No matter what we determine as to the practicality of computers in education, they are there, and are not evincing any signs of preparing to leave anytime soon. So it is becoming more and more clear that computer literacy, (the knowledge about and ability to work with a computer), if not yet a necessity, is certainly an advantageous skill to be had by an English instructor.

Reviews of the Literature

Auten, Anne. "ERIC/RCS: Computer Literacy, Part III: CRT Graphics." The Reading Teacher, 35 (1982), 966-69.
Summarizes the first two reports, both by Holly O'Donnell, then examines ERIC resources about the graphic capabilities of Cathode Ray Tube monitors and guidelines to evaluate the quality of CRT monitors' displays.

Leibowicz, Joseph. "ERIC/RCS: CAI in English." English Education, 14 (1982), 241-47.
Surveys CAI's performance and potential in English, and identifies four types of English CAI: drill and practice, tutorial, composition (dialogue systems), text analysis and editing.

Schuelke, David, and D. Thomas King. "New Technology in the Classroom:

Computers and Communication and the Future." Paper presented at the Annual Meeting of the American Educational Research Association, New York. 20 March, 1982. ED 217 879.
Summarizes recent research in CAI, primarily in reading comprehension, composition, organizational communication, and information-using skills. Includes 26 references and an appendix of more than 140 databases.

Bibliographical Resources

Auten, Anne. "ERIC/RCS: A Guide to Purchasing a Microcomputer." Journal of Reading, 26 (1982), 268-71. EJ 271 141.
Gives an overview of ERIC resources to assist a microcomputer purchaser.

----------. "So You Want to Buy a Microcomputer: A Guide to Purchasing." English Journal, 71, No. 6 (1982), 56-57.
Describes the conclusions of some ERIC resources concerning the purchase of a microcomputer for an English curriculum.

Barth, Rodney J. "ERIC/RCS Report: An Annotated Bibliography of Readings for the Computer Novice and the English Teacher." English Journal, 68, No. 1 (1979), 88-92. EJ 195 994.
Outlines 26 references from ERIC indexes dealing with computer-use in high school English instruction.

Golub, Lester S. "Some Criteria for Selecting Microcomputer Courseware for the Teaching of English." The Computing Teacher, 10, No. 2 (1982), 28-29.
Proposes "some criteria which English teachers may use for selecting and purchasing courseware," and cites some applications of courseware in English education.

Lathrop, Ann. "Courseware Selection." In Computers in Composition Instruction. Ed. Joseph Lawlor. Los Alamitos, CA: SWRL Educational Research and Development, 1982, pp. 47-60.
Cites criteria for evaluating software, and identifies some reviews of courseware. Includes a good annotated bibliography of computer software and courseware.

Thompson, Nancy. "Software Resources." English Journal, 68, No. 9 (1980), 88-90.
Updates what is available in multi-media resources appropriate for the English high school teacher's use.

CAI in English--General References

Allee, John G., Jr., and Robert L. Williams. "A Challenge for the Language Arts CAI Developer." Creative Computing, 6, No. 9 (1980), 120-25. EJ 232 845.
Notes some challenges facing CAI developers in language arts, and presents exemplary sample programs of language arts lessons.

Bell, Kathleen. "The Computer and the English Classroom." English Jour-

nal, 69, No. 9 (1980), 88-90.
Provides a general introduction to CAI in English, lists criteria for purchasing software, and delineates some representatives of schools presently using CAI programs. Includes a comparison of the Radio Shack TRS-80 Model I and the Apple II computer-systems.

Bourque, Joseph H. "Understanding and Evaluating: The Humanist as Computer Specialist." College English, 45 (1983), 67-73.
Examines word-processing, linguistic and literary analysis, CAI, writing of computer programs, and preparation and training in computer-use in English, then compares and contrasts these computer-skills with more traditional practices in the humanities, such as publishing. Suggests some criteria for evaluating software.

Boyd, Gary, and others. "Remedial and Second Language English Teaching Using Computer Assisted Learning." Computers and Education, 6, No. 1 (1982), 105-12. EJ 256 719.
Describes a CAI system used at Concordia University to improve the writing abilities of students using English as a second language.

Brandt, Ron, ed. "On Reading, Writing, and Computers: A Conversation with John Martin Henry." Educational Leadership, 39, No. 1 (1981), 60-64. EJ 253 758.
Explains Henry's use of a simplified alphabet and interactive computer programing that has resulted in children's learning to read and write much better.

Byerly, Gayle A. "CAI in College English." Computers and the Humanities, 12, No. 3 (1978), 281-86.
Identifies a number of prerequisites to succesful CAI in English. Describes some popular programing resources, including PLATO and TICCIT.

Farrell, Edmund J. "Teaching, Testing, and Technology: English in the Eighties." Paper presented at the Meeting of the Michigan Council of Teachers of English, East Lansing. 20 March, 1982. ED 220 840.
Studies trends and identifies changes necessary to improve the availability and quality of microcomputers and software programs in English instruction.

Hennings, Dorothy Grant. "Input: Enter the Word-Processing Computer." Language Arts, 58, No. 1 (1981), 18-22.
Describes what word-processing systems can do, how they can be used to teach writing skills, and weighs their advantages and disadvantages.

Jaycox, Kathleen M. Computer Applications in the Teaching of English. The Illinois Series on Educational Application of Computers. No. 19e. Urbana, IL: Univ. of Illinois, 1979. ED 183 196.
Addresses the present status of CAI in English, some current attitudes about computer-use among English teachers, and a number of aspects of computer-applications designed to augment widely practiced methods used in English classes, treating programs written in BASIC.

Kuchinskas, Gloria. "Developing Interactive Language Experiences for the Computer." The Computing Teacher, 10, No. 1 (1982), 54-56.

Outlines four basic educational principles to be kept in mind when developing interactive language programs for the computer: 1) The student-production mode in computer-language programs is writing; 2) Children learn language by modeling; 3) The computer itself is a motivating factor; and 4) Children learn by actively doing. Includes a sample program designed to motivate students in poetry writing using a "poetry starter," written in BASIC for the TRS-80 III.

Mander, Chris. "An Oakville Enterprise: Computers Teach Pre-Schoolers to Read and Write." Canadian Library Journal, 39, No. 1 (1982), 17-18. EJ 260 092.
Describes a program used in the Oakville, Ontario public library for teaching pre-schoolers to read and write using microcomputers.

Maring, Gerald H. "Computerizing Data in College Reading (and Writing) Centers for Accountability and Research." Reading World, 20, No. 1 (1980), 16-28. EJ 231 977.
Explains eight steps through which reading, study, and writing centers can develop computerized concordance-index systems to facilitate and enhance their systems. Includes sample forms used at Washington State Univ.

Oates, William. "An Evaluation of Computer-Assisted Instruction for English Grammar Review." Studies in Language Learning, 3, No. 1 (1981), 193-200. ED 218 945.
Documents the use of CAI at Indiana Univ. to give a basic grammar review to beginning writing students. Evaluates the PLATO system as a learning resource.

Powers, Richard S. "Computer-Assisted English Instruction." In Education in the 80's: English. Ed. R. Baird Shuman. Washington, D.C: National Education Association, 1981, pp. 108-12.
Refutes a number of misconceptions English teachers nurture about computer-use in the classroom, and examines the potential and feasibility of CAI in English.

Schwartz, Helen J. "Monsters and Mentors: Computer Applications for Humanistic Education." College English, 44, No. 2 (1982), 141-52.
Reviews some typical computer programs to examine what kinds of computer applications exist, and what limitations and capabilities they have. Suggests how to get, evaluate, and integrate computer programs into academia, and includes a checklist regarding how to choose, use, and develop computer programing.

Troutner, Joanne. "Third Wave Technologies: How Do I Use Them?" English Journal, 71, No. 3 (1982), 102-03.
Notes some criteria for purchasing and applying quality videotape, videodisc, and microcomputer equipment in the classroom. Emphasizes the need for English teachers to know how to coordinate technology to enhance and individualize instruction.

Vickery, Carol A. "Personal Experiences: Using Microcomputers in a Junior High School High-Potential Program." Paper presented at the Annual Meeting of the International Reading Association, New Orleans. 30 April, 1981. Ed 208 860.

Describes how one school district financed its initial microcomputer investment and encouraged teachers to use the microcomputers. Details some applications of microcomputers in an English class in writing a school newspaper, and in working with the academically gifted.

Wilson, Kara Gae. "English Teachers: Keys to Computer Literacy." English Journal, 70, No. 5 (1981), 50-53.
Presents the lack of and maligned use of computers in English classrooms, then outlines the potential uses of and needs for computer-use in English instruction.

Wresch, William. "Computers in English Class: Finally Beyond Grammar and Spelling Drills." College English, 44, No. 5 (1982), 483-90. EJ 266 969.
Examines programs concerning three areas of CAI in English: drill and practice, tutorials, and dialogue systems.

Writing Instruction--General References

Bradley, Virginia. "Improving Students' Writing with Microcomputers." Language Arts, 59 (1982), 732-43. EJ 269 739.
Describes microcomputer-uses in stimulating invention in composition through programs dealing with electronic mail, text analysis, and word-processing, and details two studies concerning the use of a word-processor in language experience and sentence-combining exercises in elementary classes.

Cottey, Patricia. "An Overview of the Computer as Teacher: A Progress Report of a Research Project to Introduce Diagnostic Testing and Computerized Instruction into the Composition Program at Northeast Missouri State University." Paper presented at the Annual Meeting of the Conference on College Composition and Communication, San Francisco. March, 1982. ED 217 490.
Describes three instructors' use of CAI to test basic writing skills and to instruct those students having deficiencies in writing skills. Surveys literature concerning computer-use in English, and maintains that teachers should write their own computer programs.

Lawler, R.W. "One Child's Learning: Introducing Writing with a Computer. A.I. Memo No. 575." Washington, D.C: National Science Foundation, 1980. ED 208 415.
Observes that computer-access significantly affects a child's learning, and presents a case study of one child's experiences to show how a computer-based introduction to writing can work.

Lyons, Thomas R. "Computer-Assisted Instruction in English Composition." Pipeline, 6, No. 2 (1981), 13-14. EJ 255 511.
Describes the CAI system used in the College Expository Program at the Univ. of Colorado at Boulder. Outlines some computer-packages dealing with organization and style in students' compositions.

Marcus, Stephen. "Compupoem: A Computer-Assisted Writing Activity." English Journal, 71, No. 2 (1982), 96-100. EJ 257 703. Reprinted in

The Computing Teacher, 9, No. 7 (1982), 28-31, as "Compupoem: CAI for Writing and Studying Poetry."
Explains a simple computer program for writing poetry, then delineates some advantages and disadvantages of CAI in English.

Moran, Charles. "Word-Processing and Teaching of Writing." English Journal, 72, No. 3 (1983), 113-15.
Describes the author's experiences in overcoming writing anxiety, and speeding editing processes by using a word-processor, and weighs the pluses and minuses of word-processing.

Southwell, Michael G. "Computers and Developmental Writing." The Computing Teacher, 10, No. 3 (1982), 34-35.
Explains the positive results obtained at the City University of New York's York College by using microcomputers in autotutorial instruction with English as a Second Language teaching techniques.

----------. "Using Computer-Assisted Instruction for Developmental Writers." AEDS Journal, 15 (1982), 80-91. EJ 264 802.
Discusses a number of ways to use CAI to assist college freshmen in the learning of conventional usage and grammar skills in written English.

Wall, Shavaun M., and Nancy E. Taylor. "Using Interactive Computer Programs in Teaching Higher Conceptual Skills: An Approach to Instruction in Writing." Educational Technology, 22, No. 2 (1982), 13-17. EJ 261 908.
Notes some common needs of the composition curriculum, then identifies how microcomputers can be used to meet them. Includes an example of an interactive computer-assisted instructional model for writing.

Woodruff, Earl. "Computers and the Composing Process: An Examination of Computer-Writer Interaction." In Computers in Composition Instruction. Ed. Joseph Lawlor. Los Alamitos, CA: SWRL Educational Research and Development, 1982, pp. 31-46.
Examines three potential uses of the computer in a writing class: as consultant, as questioner, and as collaborator; identifies the strengths and weaknesses of each.

Teaching Writing as a Process

Burns, Hugh. "Computer-Assisted Prewriting Activities: Harmonics for Invention." In Computers in Composition Instruction. Ed. Joseph Lawlor. Los Alamitos, CA: SWRL Educational Research and Development, 1982, pp. 19-30.
Explains the author's own programs for heuristics, designed to encourage idea-generating, based on Aristotle's topics, Burke's Pentad, and Young, Becker, and Pike's Tagmemics.

----------. "A Writer's Tool: Computing as a Mode of Inventing." Paper presented at the New York College English Association Conference, Saratoga Springs. Oct., 1980. ED 193 693.
Explains the potentials of computer-use in directing and prompting inquiry and idea-generating on the part of students, and how interactions with com-

puters assist in raising to the conscious level what students already know about their writing topics.

----------. Stimulating Rhetorical Invention in English Composition through Computer-Assisted Instruction. Austin: Univ. of Texas, 1979. ED 188 245.
Concludes that CAI can be used to advantage in several ways to encourage students' prewriting activities, based on a study of students in four freshman composition classes.

Cronnell, Bruce. "Computer Based Practice in Editing." Los Alamitos, CA: SWRL Educational Research and Development, 1982. ED 220 869.
Delineates some factors to consider when comprising a program to use on a word-processor with the purpose of editing students' papers. Also includes a number of possible means of organizing such a program.

----------, and Ann Humes. "Using Microcomputers for Composition Instruction." Paper presented at the Conference on College Composition and Communication, Dallas. March, 1981. ED 203 872.
Explains a number of activities with which a computer can assist in the teaching of writing revision in English composition, and notes some uses of microcomputers and word-processors in sentence-combining, and generating and arranging content.

Frase, Lawrence T., and others. "Computer Aids for Text Assessment and Writing Instruction." Performance and Instruction, 20, No. 9 (1981), 21-24. EJ 256 681.
Discusses the uses of computers in improving written documents and writing instruction, surveys a set of programs designed to provide automatic editorial feedback, and describes the rationale behind these programs.

Humes, Ann. Computer Instruction on Generating Ideas for Writing Description. Washington, D.C: National Institute of Education, 1982. ED 220 868.
Proposes a program to help elementary-level students use computers in idea-generating for descriptive writing. Includes orientation procedures to introduce computer-using to students, and explains three lessons requiring use of computer graphics.

Monahan, Brian D. "Computing and Revising." English Journal, 71, No. 7 (1982), 93-94.
Describes the author's use of computers to encourage his students in revising text.

Prentice, Lloyd R. "A Program for Word People." Classroom Computer News, 2, No. 1 (1981), 18-20. EJ 260 506.
Presents a program in BASIC for the Atari 400 or 800 computer that generates haiku poetry.

Schwartz, Helen J. "A Computer Program for Invention and Feedback." Paper presented at the Annual Meeting of the Conference on College Composition and Communication, San Francisco. March, 1982. ED 214 177.
Describes a program designed to assist students in writing better essays by providing heuristics for invention and a means for audience feedback.

Schwartz, Mimi. "Computers and the Teaching of Writing." Educational Technology, 22, No. 11 (1982), 27-29.
Suggests ways of using the computer to encourage students in making more substantive changes when rewriting text. Explains how to use some interactive activities between students and computers to increase rewriting-changes.

Shostak, Robert. "Computer-Assisted Composition Instruction: The State of the Art." In Computers in Composition Instruction. Ed. Joseph Lawlor. Los Alamitos, CA: SWRL Educational Research and Development, 1982, pp. 5-18.
Outlines three factors upon which hinges the success of CAI in writing: 1) Answering the computer to student ratio question, and determining the amount of class time allotted to students for computer-use in composing; 2) Teaching writing as a process; and 3) Convincing instructors and administrators that CAI is "the state of the art in the teaching of writing." Introduces a number of computer programs for use in each of the stages of the writing process.

Wresch, William. "Computer Essay Generation." The Computing Teacher, 10, No. 7 (1983), 63-64.
Explains the program Essaywriter, which assists students in topic-generating and putting ideas into effective forms.

----------. "Prewriting, Writing, and Editing by Computer." Paper presented at the Annual Meeting of the Conference on College Composition and Communication, San Francisco. March, 1982. ED 213 045.
Describes four computer programs designed to help students in the separate stages of the composing process, and explains their limitations and strengths.

Spelling Instruction

Block, Karen K. "Cognitive Theory, CAI, and Spelling Improvement." Journal of Computer-Based Instruction, 5, No. 4 (1979), 86-95. EJ 209 845.
"Reviews several development and research activities that were an out-growth of using cognitive theory to design CAI programs in spelling" (ERIC), and explains the psychological theory used as a conceptual basis for a number of instructional programs.

Fox, Annie. "Quiz Time in the Classroom: Spelling Bee." Creative Computing, 8, No. 10 (1982), 18-20. EJ 267 514.
Examines "Spelling Bee," an Applesoft BASIC program suitable for use in grades K-3.

Hasselbring, Ted S. "Remediating Spelling Problems of Learning-Handicapped Students through the Use of Microcomputers." Educational Technology, 22, No. 4 (1982), 31-32. EJ 261 917.
"Describes a program designed to provide students with individualized spelling remediation using imitation and modeling techniques" (ERIC).

Powers, David E. "Perquackey." Creative Computing, 6, No. 4 (1980), 70-78.
Explains a word game, written in TRS-80 Disk BASIC, whose object is to form

as many words as possible from a group of random letters.

While digging up references for the annotated bibliography, I found myself referring again and again to the same several sources:

Computers in Composition Instruction. Ed. Joseph Lawlor. Los Alamitos, CA: SWRL Educational Research and Development, 1982. This book, "the proceedings of a research/practice conference," is available through the Southwest Regional Laboratory for Educational Research and Development. I've cited some of its chapters in my bibliography.

The Computing Teacher is a monthly journal published from September to May by the International Council for Computers in Education. It frequently includes a column entitled "Bits 'N' Pieces: Computers in the Teaching of English" that is co'edited by Robert Shostak and Lester S. Golub.

Creative Computing is a popular computing magazine that comes out monthly.

Educational Technology, which devotes much of its space to computer-use in education, is published monthly by Educational Technology Publications, Inc. While tracking down articles in this journal, I stumbled across a few issues that, although not dealing specifically with English, dealt strictly with CAI, microcomputers, and courseware, and were very instructive: Vol. 18, No. 4 (1978); Vol. 19, No. 10 (1979); and Vol. 23, No. 1 (1983).

ERIC indexes document many of the references included in my annotated bibliography, and most of these are obtainable through ERIC or University Microfilms, Inc.

NCTE publications, especially College English, English Journal, and Language Arts, contain a number of articles dealing with computer-use in the various levels of English education.

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A COMPUTER LANGUAGE ARTS CLASS?

by

Judy Self

(The following lesson plan was found programmed into the *Direct Memory Access* of Teacher *Terminal 6400*. Though *Interfacing Cable* was frayed, *Terminal 6400* was able to *Print* onto this *Peripheral* the situation, *Byte* by *Byte*, omitting no *Bits*.)

] *READ DATA: CLEAR RN 211*

] *RESET: begin line 10:00 [BELL]*

] *ENTER RANDOM DATA: 13-15 yr. old CHARACTER $TRING$*

] *GROUP RANDOM DATA: 3 64K APPLES, 5 48K APPLES, 10 32K APPLES, 8 16K APPLES*

] *READ DATA: --"RANDOM OUTPUT"--*
64K $: SHIFT & RUN
48K $: INPUT, OUTPUT & RUN
32K $: POKE, OUTPUT & RUN
16K $: PEEK & ESCAPE

] *RESET: purge RANDOM OUTPUT FILE*

] *RESTORE*

] *RESUME: line 10:03 [BELL]*

] *CATALOG: --"CHECK AVAILABLE"--*
IF CK CONSTANT, THEN GO FORWARD, line 10:05
IF CK=NULL, THEN STOP
GO TO LOG: SAVE NEW DATA, THEN GO TO line 10:07

] *CHECK OUTPUT: 64K APPLES, 48K APPLES, 32K APPLES, 16K APPLES*

] *STOP: READ NEW DATA*
IF APPLE 16K $ PEEK at APPLE 32K $ OUTPUT, THEN POINT APPLE 16K $
IF APPLE 48K $ POKE APPLE 32K $, THEN RESET APPLE 48K $ at 10:17

] *RESUME*

] *INPUT NEW DATA into RANDOM DATA*

] *STOP: POINT APPLE 32K $ to STOP POKE APPLE 16K $*

] *RESUME*

] *CONTINUE READ APPLE 32K $ DATA*

] *STOP: --"CHECK AVAILABLE"--*

] *RESET: APPLE 16K $*

] *SHIFT: APPLE 32K $ to AUXIL ROUTINE to CLEAR OUTPUT*

] *STOP: READ RANDOM DATA*
IF SYNTAX ERROR, RESTORE INPUT, THEN RESUME
IF CK CONSTANT, THEN GO TO TEST$

] *PRINT TEST$*

] *RUN TEST$*

] *STOP: READ RANDOM DATA*
IF OUTPUT DATA=NEW DATA, THEN SAVE
If OUTPUT DATA≠NEW DATA, THEN STOP
CLEAR INPUT & OUTPUT
SHIFT
RUN to nearest TERMINAL
ESCAPE: GO TO SUB